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and COLLEGE
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CARRIACOU: AN OLD WORLD IN THE NEW*

ROBERT C. KINGSBURY
Indiana University

THE GRENADINES, an arc of 125 small volcanic islands between Grenada and St. Vincent, are very probably the least known section of the Lesser Antilles (Fig. 1). Although these islands have been inhabited continuously for over 300 years, it is not possible to assemble more than a fragmentary historical account. Even today, there is virtually nothing in the way of statistical data or other information, published or unpublished. No topographic maps exist and the current naval chart covering these islands has many errors in island shapes, roads, settlements, and local names.[1]

Lack of knowledge and lack of outside interest in the Grenadines can be attributed, first of all, to their small size and population—only 35 square miles and scarcely 12,000 people. Communication with the outside world is still almost exclusively conducted by sailing vessel. All ocean-going freighters and most inter-island vessels avoid their waters, first, because they are in a reef and rock-infested sea with a long history of shipwreck, but more important, because these islands have little to sell abroad, little money to buy abroad. As wards of the larger islands of Grenada and St. Vincent, the Grenadines are, for the most part, apparently ignored. Even the American tourist, now invading the Lesser Antilles in force and long renowned for his ability at finding out-of-the-way places, has not yet "discovered" these islands.[2]

A Dramatic Landscape

As the largest, the most thickly populated, and the longest continually occupied, Carriacou is in every way the most important island in the Grenadines (Fig. 2).[3] The island is about 7 miles long and 2½ miles wide and is placed 4-6 hours north of Grenada by commercial sailing vessel from St. George's. Some 6,431 people (Census of 1960) are scattered over the island's 13.25 square miles

* The material in this article is, for the most part, contained in *Commercial Geography of The Grenadines* (Department of Geography, Indiana University, May, 1960), the first of 12 technical reports on islands and island groups of the British Lesser Antilles, the result of a research study sponsored by the Geography Branch, Office of Naval Research.

The author engaged in field work in the Grenadines during June–September, 1959. He spent several weeks on Carriacou and smaller periods of time on other inhabited islands in the Grenadines.

The island sketches accompanying this article are the work of Brian P. Birch, graduate student in geography at Indiana University.

[1] Hydrographic Office chart 1279 covers most of the Grenadines; H.O. chart 1640 includes most of Bequia, northernmost of the islands.

[2] Excluding the travel section of the New York *Times*. See Richard M. Hudson, Jr., "A West Indian Island for the True Escapist," New York *Times*, February 8, 1959, and James H. McCormick, "The Grenadines: Yachting Paradise," New York *Times*, December 13, 1959.

[3] Spelled *Kayryouacou* in the seventeenth and early eighteenth century records. The name is of Carib Indian origin. Other inhabited islands in the Grenadines are, in declining order of population, Bequia, Union, Canouan, Petit Martinique, Mayero, Mustique, and Rhonde.

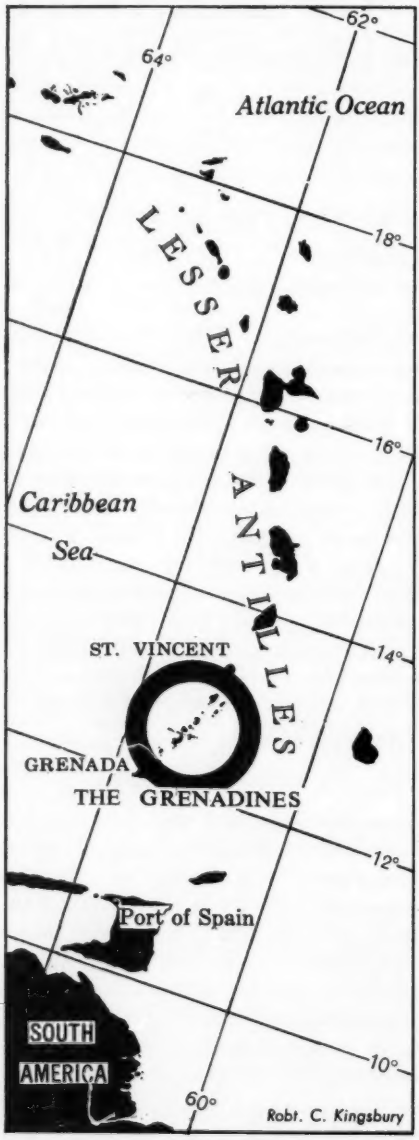

FIG. 1. The Grenadines in the Lesser Antilles.

of land, a density of 485 persons per square mile. (This excludes Petit Martinique, a small adjoining island with a population of 528 which is attached to Carriacou for administration purposes.) Although Carriacou is owned by Grenada, its solid rock northern extension, Gun Point, was granted accidentally to St. Vincent in 1791 when latitude was used as the basis of partitioning the Grenadines.

Carriacou's topography reflects its vol-

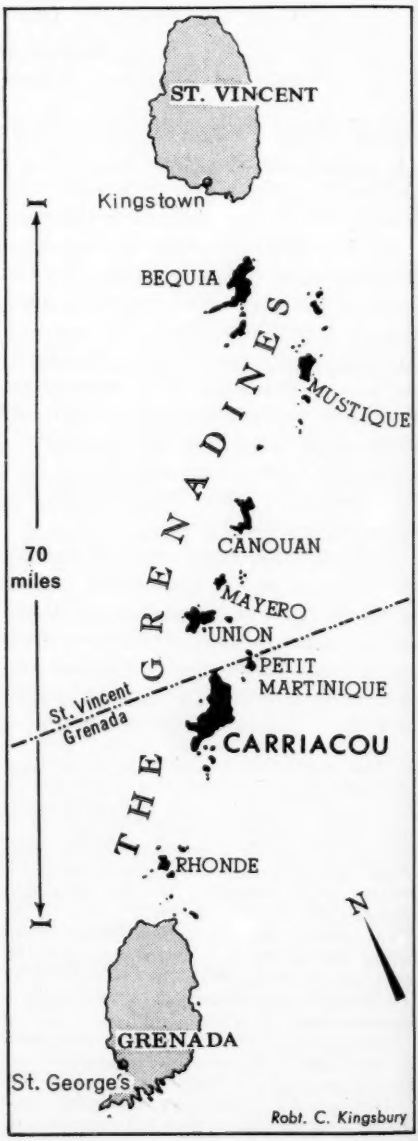

FIG. 2. Carriacou in the Grenadines.

canic nature: a disordered arrangement of sharply rising hills and steep-sided valleys fills its interior (Fig. 3). A rugged central hill core rising to almost 1,000 feet dominates the island (Fig. 4). Here and there pocket-sized valleys or tiny coastal plains, about 8 or 10 in all, are squeezed between the slopes and the sea.

Dominant soils are the result of intense weathering of volcanic materials. The typical soil available for agriculture is a deep brownish clay which is acidic, crumbly, friable, and extremely porous—scarcely genuinely fertile. The best farming lands are alluvial deposits, but these are small and sparsely distributed and often are inadequately drained.

Widespread and disastrous erosion is evident everywhere. Deforestation and overgrazing have left the soil completely at the mercy of wind, rain, and sun, and erosion has been encouraged by centuries of improper land use and resulting soil exhaustion and abandonment. Perhaps the single redeeming feature is that with proper soil and water conservation, rapid weathering of the underlying rocks can give birth rather easily to new soils capable of supporting reasonably good crops.

The Acute Water Problem

The island enjoys a tropical-type climate where cold weather is unknown and the tempering effect of sea breezes over a narrow land mass usually makes hot weather temperatures no serious problem. Rainfall, however, is critical. The average fall of 35 to 55 inches yearly is characterized by common and extreme departures from the normal and by an uncertain seasonal distribution. Further, there are no permanent streams, no lakes, and few other natural storage facilities, and the common, short, heavy downpours run off rapidly down the sharp slopes to the sea.

So unreliable is this rainfall and so unsuccessful are the inhabitants and their land in retaining what little is received that the island faces almost a perpetual water shortage. Virtually all homes have cisterns of some type, some 27 small stone water catchments are scattered through the island, and there are a few shallow open wells and special storage tanks. In spite of these facilities, however, at critical times supplemental water must be hauled to the island.

Drought and resultant crop failure and animal deaths are common. Grenada newspaper records of the nineteenth and early twentieth centuries mention severe droughts every few years in Carriacou. Drought struck again in 1959. The main food crop was reduced to 10 per cent of normal and emergency food supplies had to be brought from Grenada to prevent starvation.

Carriacou lies on the fringe of the West Indies hurricane belt and in the past severe tropical storms seldom have lashed its shores. However, in September, 1955, with scant warning, a hurricane ("Janet") of very considerable intensity swept directly across the southern Grenadines and the island suffered severely in loss of life, homes, boats, crops, trees, and other property. Old massive stone plantation homes provide an indication of the storm's strength: several built 150 years ago, in good livable condition, and never previously bothered by storms, were ripped apart by this hurricane. Four years later, in 1959, the island still had not recovered from the economic effects of this blow.

The People of Carriacou

The population is predominantly Negro, the descendents of former slaves brought from Africa in the eighteenth and early nineteenth centuries. "Mixed or colored" peoples are an important minority. The major group of these are the descendents of Scottish shipbuilders brought to the island in the nineteenth

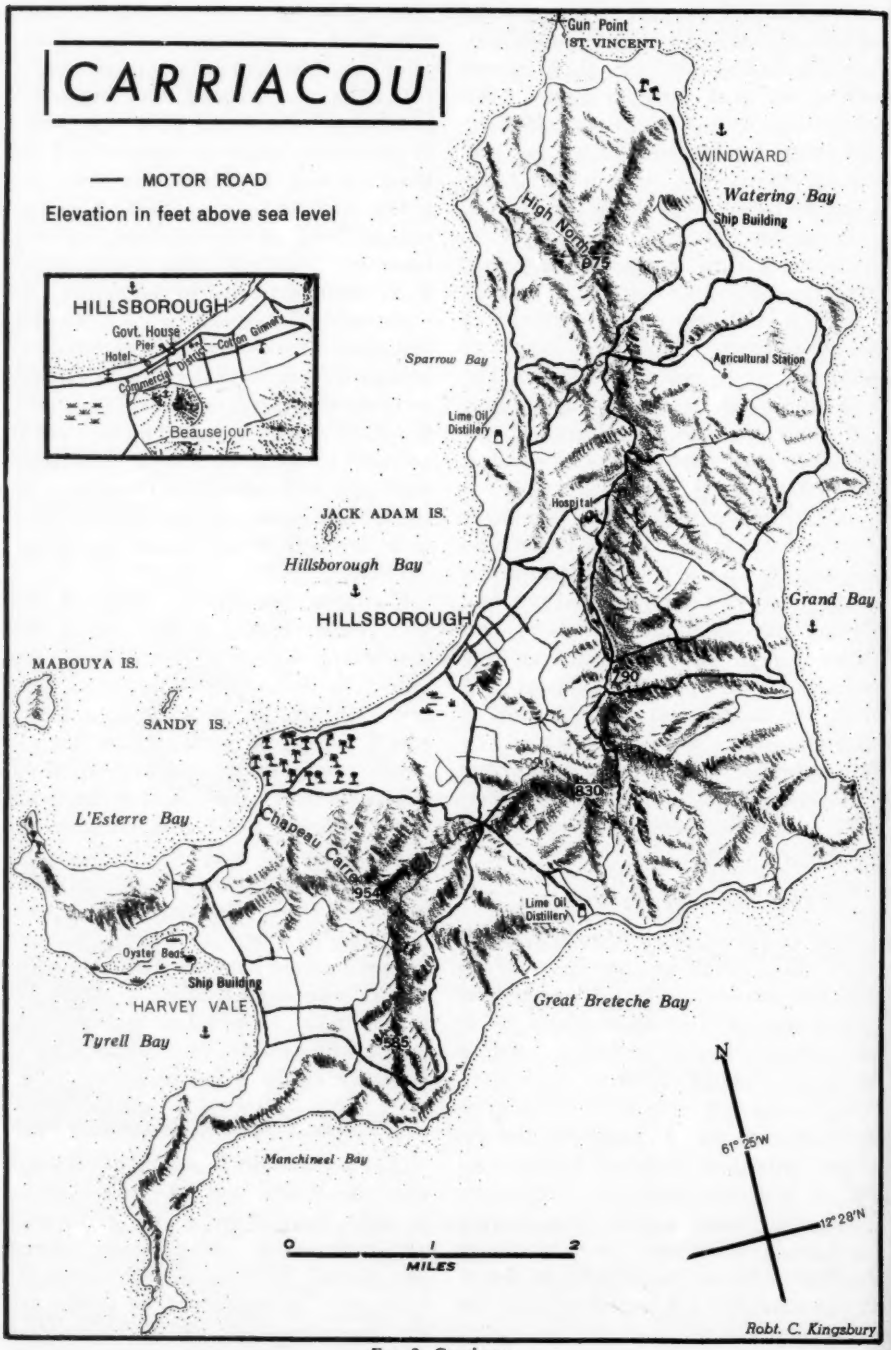

FIG. 3. Carriacou.

century; even today such Scottish family names as McQuilken, McLaren, Stuart, Warwick, and Oliver are well known. True Caucasian people are non-existant except for an occasional minister, priest, or government medical officer stationed temporarily on the island.

The population of Carriacou has increased only slightly during the last 40 years. Early in this century the island appears to have reached its maximum "carrying capacity" in terms of a predominantly agricultural economy. Further population growth was avoided by emigration. However, the population density is still high and, in terms of cultivated land, there are over 1,500 persons per square mile.

The literacy rate is high, about 90 per cent, a figure well above the average of Grenada proper. Education for the young is considered of paramount importance by most parents.

The Historical Background

About 300 years ago Carriacou was settled by French planters. Towards the end of the seventeenth century, the English seized the island and much of the best land. However, the French planter colony continued for some time and even today there are evidences of this French heritage in family and settlement names, a patois still in use, and in roads, homes, and buildings.

The island was divided into European-owned and managed estates until the mid-nineteenth century. In 1784, there were 50 such estates varying in size from 16 to 550 acres.[4] Most grew sugar cane and cotton based upon slave labor. Each estate ginned its own cotton and processed its own cane into crude brown sugar. Most of both were exported to the United Kingdom.

In 1834, when slavery was abolished, Carriacou contained 2,700 Negroes and just over 400 Europeans and people of mixed blood. The Europeans lived in near palatial homes, each part of an extensive settlement of stone factory and storage buildings, windmills, and slave quarters. Through the middle and late nineteenth century, one by one, most of these plantations were closed and the Europeans departed.

Today, about 5,000 acres, two-thirds of the island, are divided into 2,270 holdings. One-half of this peasant acreage resulted from six land settlement (really, just land distribution) schemes of the government. Between 1903 and 1934, several former European-owned estates, each over 300 acres, were acquired, subdivided, alloted, and sold to local landless farmers. Most farmer holdings today are very small, around two acres, but there are a few larger holdings of 30-200 acres. Most of the latter are remnants of European estates and large portions are rented for cash or are share-cropped.

The remainder of the land is government owned and includes forest reserves (largely secondary dry woods and scrub), an agricultural station, a sizeable lime estate, coconut plantings, supervised public grazing grounds, and swamps. The government is expected eventually to sell further cultivable lands to small land owners and landless farmers.

Today most of Carriacou's people are rural, scattered according to the available agricultural land and in settlements of up to a dozen or two dozen households, many of which occupy the house sites of long since dissolved plantations and are identified by the old estate names (Fig. 5).

The single village is Hillsborough with a population of 567. It is along the west or sheltered coast of the island. It is the chief port and the main commercial and political center. Massive stone warehouses with two foot thick

[4] This is recorded on an old map which hangs in the vestry of the Catholic Church in Hillsborough, Carriacou.

FIG. 4. Carriacou and Hillsborough Bay from Hospital Hill.

FIG. 5. Country Lane near Hillsborough, Carriacou.

walls, possibly of eighteenth century French origin, are found along the main street and still house some of the principal commercial establishments on the island (Fig. 6). Although it has no electricity yet, a small public power plant is scheduled for future installation.

An extensive 73 mile road system, about two-thirds motorable, the more traveled surfaced with asphalt, interconnects the many old estate settlements, shipping bays, and the town of Hillsborough. Apparently the French can be thanked for the well-built net. It is believed that the French, lacking adequate naval support, built these roads in order to be able to roll their caissons from bay to bay and pelt the British fleet which kept appearing at different inlets.

Corn and Cotton Agriculture

Agriculture today represents a major segment of the island's economy. At best, this agriculture is poor because of insufficiencies of soils, level land, rainfall, cultivation practices, and quality of seed and livestock.

The total cultivated land amounts to about 4,200 acres; the bulk here is in ground crops in contrast to tree crops. Corn is the major subsistence crop, grown for both human and animal consumption. It is very often intercropped with cotton, the main commercial crop, and many times with peanuts, cassava, pigeon peas, or other vegetables. A variety of tropical fruits are grown and most homesteads have bananas and other fruit and beverage plants and trees.

Short-staple cotton is the commercial crop of small landowners while two other commercial crops, coconuts and limes, are grown on government estates and on a single private plantation.

Cotton production has been declining gradually although year to year output fluctuates greatly in response to weather conditions. Further recent decline can be attributed to labor shortages and the working of fewer cotton lands; these, in

FIG. 6. Main Street, Hillsborough.

turn, result from soil exhaustion, lower profits, and the turning of farmers to other crops and other means of livelihood. In 1956, cotton was produced on about 1,500 acres; the average yield was 242 pounds per acre for a gross income of $11.23 per acre.[5] However, low yields and low prices kept many cotton fields from being harvested.

Sheep and goats are the most common animals and are kept for meat, milk, and skins. Cattle, too, are kept for their meat and milk. All three of these animals count in the export trade and, in years of commercial crop failures, they are an extremely important source of farm income.

Wealth from the Sea

Increasingly, the Carriacouans have turned to the sea for their living and have found it more bountiful and reliable than the land. This wealth flows into the island in two ways. First is the fishing industry. Nets, pots, and lines at sea and seines along the beach land an important part of the islanders' diet and, in addition, furnish an export that is sold profitably fresh, salted, or dried in Grenada and Trinidad.

More important to the economy than fishing are the many sailing schooners used as trading vessels to haul passengers, animals, and all manner of cargo through the islands. Some 50 such vessels were registered in 1959. Some operate entirely within the Grenadines or between Grenada and the Grenadines, but a larger number sail all over the eastern Caribbean carrying whatever they can obtain in consignment cargo and passenger traffic. Ports from Guadeloupe to Trinidad, including Dominica, Martinique, St. Lucia, St. Vincent, and Grenada, are most frequented. Occassionally Grenadine vessels journey northward to the British Leewards and to the French and Dutch islands of the same area—less often to the Virgin Islands, British Guiana, and the Venezuelan coast. Vessels may be away from their home island weeks and months at a time, the crew returning to their families with funds and purchases only as cargo consignments permit or when major vessel repairs must be made.[6]

All of these trading vessels, usually schooners, as well as the smaller fishing vessels, usually sloops, were built on the island (Fig. 7). The vessels are crude and rough, made of hand-hewn timbers and fitted with massive wooden keels. (Wood is preferred to lead as it allows easier careening: there are no drydocks in Grenada, St. Vincent, or the Grenadines.) Many are fashioned in a rough shoreside cradle and the workmen follow long traditional methods using no plans or power equipment. Cedar, which turns stronger in salt water, is a popular construction wood. In 1959, shipbuilders had to depend upon imported white cedar as local supplies were long ago exhausted. Green heart timber imported from British Guiana often is used for the hulls. Although the finished vessel is crude, it is sound and seaworthy, and, barring reefs and hurricanes, will last 30 or more years if well maintained, and most are well maintained. A rough 35-40 foot vessel costs about $2,400-$3,600; when completely outfitted for the sea, $5,400-$7,200. A finished 50-60 foot schooner (without engine) would sell for about $15,000. For the most part, however, the vessels are not built for speculation sale. Rather, they are built to order and the craftsmen work by the direction and alongside the owner and financier.

The sailing vessel has a limited carrying capacity, generally about two times its gross tonnage, and freight is carried both above and below deck. Most schoon-

[5] All prices given have been converted to U.S. currency.

[6] See Otis P. Starkey, "How We Live in The West Indies," JOURNAL OF GEOGRAPHY, Vol. 59, March, 1960, pp. 123-127.

FIG. 7. Schooner Construction, Windward, Carriacou.

ers carry a compliment of 8-12 crew members. The larger vessels can carry up to about 50 deck passengers, but they have no stateroom accommodations and only limited amenities and safety features. These vessels are all slow, rarely operate on fixed routes, and sail on irregular schedules. Arrival time is uncertain, especially for the two dozen Carriacou vessels not equipped with auxiliary engines. There are no refrigeration facilities for fresh produce and icing is rarely employed; spoilage by sun and salt is common. Loss of cargo through storm and shipwreck occurs quite often. However, in spite of these many disadvantages, a great amount of cargo and a considerable number of passengers in the Lesser Antilles move on sailing vessels. In all cases, cargo and passenger rates are lower than any competing means of transport: this is, of course, the sailing vessel's great advantage. As a Caribbean Commission report points out, "In a region where purchasing power is low, considerations of comfort, security, and regularity are subordinated to the fact that the amount of cash involved is comparatively small."[7]

The Role of Invisible Exports

Carriacou depends upon Grenada and other West Indian and foreign sources for virtually all manufactured goods and a high per cent of necessary foodstuffs. The island has only a little fish, cotton, lime oil, and a few animals to sell abroad, a total far from sufficient to pay for its imports. The island's present economy depends upon the important role of invisible exports.

The lack of opportunity within the island has helped foster emigration, a process that has been operative for many decades. One observer on Carriacou believed that 500 Carriacouans had left the island during the 18 month period ending in August, 1959.[8] The movement is

[7] C. J. Burgess "Transportation and Communications: (a) Intra-Caribbean," *Documentation for Trade Promotion Conference*, Trinidad, 1954, mimeographed, p. 11.

[8] Personal interview, August, 1959.

largely of males. Grenada and Trinidad are the destinations of most migratory workers, but a considerable number have gone also to work in the oil refineries of Aruba and Curacao, and to Canada and the United Kingdom. In 1956, 172 Carriacouans, 72 per cent male, were reported to have emigrated to the United Kingdom alone.

Without question, the bulk of all islanders that leave for more promising economic opportunity elsewhere do so only on a temporary basis. Most retain strong family and cultural connections in Carriacou and expect to return to their former homes when they have "made their fortune." Of course, this does not always work out. Some marry abroad, put roots and savings into foreign soils, and never return permanently. Many do, however, send funds back to their families in Carriacou and maintain a relationship with their home island throughout their life. There is no way of estimating these remittances, but the general impression gained from interviews with islanders having close relatives abroad, postal and other government authorities, and trades people is that the amount of remittances, though individually small, is steady and continuous, and the total amount must add very considerably to the island's economy.

After a period abroad, many Carriacouans return to their homeland and bring with them much of their savings and what material property acquisitions that can be carried or shipped. Often, the savings will be invested carefully in a homestead, agricultural land, a business, a trading vessel, or other income producing property. Material possessions that have been brought to the island in this fashion include such items as automobiles, furniture, stoves and refrigerators, and sewing machines.

A considerable quantity of real property also reaches Carriacou by returning sailing vessels. Crew members buy and sell on their own and often return with cash profits or with goods purchased where prices are lowest. Ancillary to this practice is smuggling. A wide variety of items are landed in the Grenadines without payment of duties. While factual data of such operations is unavailable for obvious reasons, ample evidence of smuggling is provided by street hucksters as well as imported merchandise on sale in commercial houses. In spite of the fact that wholesale and shipping costs are higher to Carriacou than to Grenada, the retail prices in many stores of a number of items, including cigarettes and liquor, are well under Grenada retail prices. Certainly, the entrance of these less expensively purchased commodities, both for personal consumption and for resale, serve to help better the islanders' level of living as well as to help decrease their cost of living.

There are no current estimates on schooner earnings although 15 years ago the gross earnings by sailing schooners from Carriacou and Petit Martinique were placed at $500,000 yearly. In more recent years the motor vessel has cut deeply into the schooner trade. However, though the sailing vessel may have a decreasing percentage of the total shipping business in the Lesser Antilles, the generally increased quantity of total shipping, the ability of the sailing vessel to undercut the rates of other shipping, and its willingness to take small cargoes to out-of-the-way islands and minor ports have kept it in continued importance. While probably it no longer can be placed in the lucrative earning class, still the sailing vessel is considered by many Carriacouans as a sound investment choice, and yields on capital are probably the best return now known on the island.

The tourist industry potential of Carriacou is not inconsiderable. Certainly it has many of the necessary ingredients in abundance—a comfortable climate with

ample sea breeze and little rain; a colorful history evident in old massive sugar and cotton mill towers, warehouses and shops, and plantation homes; miles of untouched, crisp, and clean sand shores; scores of nearby coral reefs with all manner of fascinating marine life; a profusion of flowering shrubs and tropical fruits; easily accessible heights, each with its own memorable show of a many hued tropical sea, tiny sail craft, frothy reefs, and the prodigious landscapes of other startingly abrupt Grenadine islands. A few West Indian tourists from Grenada and Trinidad do use the facilities of the several small boarding houses. However, the one small waterfront hotel in Hillsborough which is suitable for American and European tourists has so few visitors that it is open only "by appointment," and the appointments may be months apart.

Transport is the main tourist problem. Since Carriacou, for all practical purposes, has no air connections and accomodations on the small passenger-carrying sail and motor vessels are uninviting to most foreign tourists, there is no adequate means of reaching the island. There is sufficient level land for the construction of a single runway of length that could accomodate the two engine aircraft employed by British West Indian Airways on their present "island hopping" routes. However, there are no plans for such construction presumably because of the lack of available funds. Until such time as transport arrangements are improved, there appears to be no hope for the island to develop any tourist industry.

The Future

Carriacou has seen little in the way of modern social and economic development and, in many respects, life and livelihood move along about as they did in the days of the great European plantations. Much of what the islanders have, and materially this is not very much, they have earned and paid for themselves.

Obviously, this island could use a generous measure of financial and technical assistance. However, the islanders do not seek the former and the latter would appear far more important. Help is needed in improving boat design and construction, in fishing methods and marketing, in cottage industry development, and in many phases of agriculture. At the present rate of severe erosion, it will not be too many years before there will be no decent agricultural land at all. As it is, rain and wind are so energetically attacking the unprotected soil that each year further farmland goes out of production and on that still remaining, the yields become progressively less and less. Cotton appears to be no longer suitable, but some substitute commercial crop probably would be advantageous; increased home food and animal production is needed also.

There are a number of future possibilities. Certainly, tourism holds promise if the transport situation can be solved. The use of sailing craft in inter-island trading is on the wane, but until an inexpensive substitute appears, Carriacou vessels should be able to furnish their seamen an acceptable living and their financiers a reasonable profit. Necessity has helped make the island self-supporting; its people are more self-reliant and more resourceful than many West Indians. Even without outside assistance, the people of Carriacou leave the impression that they will manage alone and manage reasonably well.

SYSTEMATIC AND REGIONAL APPROACHES TO HIGH SCHOOL GEOGRAPHY

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THE SAME "BUG-A-BOO" which plagued Hettner, Penck, Ratzel, and other nineteenth century German geographers is still very much a problem today. That is, how does one approach the study of geography from the systematic or the regional view point?

In secondary school teaching, this controversy becomes especially meaningful, for the average high school pupil is lacking in geographical background. In order for this pupil to progress in acquisition of geographic skills, understandings, and attitudes, he must first be well grounded in basic factual material.

One approach to the problem is to divide a course into halves such as the semester division of an academic year. It then becomes possible to have both systematic and regional sub-courses within a course. In such a division, it is usually best to precede regional study with systematic, for many problems arise in regional analysis that can be explained only by a thorough systematic background.

Much material must be omitted in high school geography teaching because of the time element and ability levels. Therefore, a teacher must be careful to choose units that cover the important and meaningful (to the pupil) branches of the subject, and that also fit readily into the necessary learnings of the modern, "life-centered" curriculum.

Year Course Outline

An example of a year course outline based on the principle of first semester—systematic, second semester—regional, might include:

I. First Semester—Systematic
  A. Unit on climate
    1. Temperature
      a. Manifestations and measurement (diurnal, absolute, etc.)
      b. Controls
      c. Significance
    2. Precipitation
      a. Manifestations and measurement (yearly, seasonal amounts, etc.)
      b. Controls
      c. Significance
    3. Continentality-oceanicity
  B. Unit on food
    1. Food from plants
      a. Cereals
      b. Non-cereals
    2. Food from animals
      a. Livestock
        (1) Meat
        (2) Dairying
        (3) Poultry
      b. Fisheries
  C. Unit on crops and their industrial uses
    1. Plants
    2. Lumbering
    3. Animal
  D. Unit on mining, minerals, and their uses
    1. Metallic minerals
    2. Non-metallic minerals
    3. Iron and steel mills; their operation and location
  E. Unit on power, transport, and communication
    1. Power
      a. Thermal electric power
      b. Hydroelectric power
      c. Others
    2. Transport
      a. Rail
      b. Road
      c. Sea
      d. Inland waterway
      e. Air
    3. Communication
      a. Mail
      b. Telegraph and cable
      c. Radio and television
      d. Other

II. Second Semester—Regional (subdivision of individual units left to teacher, dependent largely on text)
  A. Unit on Anglo-America
  B. Unit on Latin America
  C. Unit on the Eurasian land mass
  D. Unit on the Mediterranean and Middle Eastern lands
  E. Unit on Africa South of the Sahara
  F. Unit on the Far East, Australia, and Oceania

Comments on Outline

It must be kept in mind that it is impossible to divorce completely the systematic from the regional approach. For instance, in the unit on industrial crops (systematic), much regional presentation concerning world distribution of rubber trees, sheep, coniferous forests, etc. will be made. Similarly, any unit on Mediterranean lands (regional) must give careful consideration to the causes and functions of the climatic types found there—a systematic process.

It will also be noted that many glaring omissions apparently occur in the systematic unit headings. No mention is found of landform, cartographic, or urban geography units. Again, such omission is purely arbitrary (based on the time and ability level limitations).

The regional unit headings are likewise arbitrary. One notes that the traditional continent headings have been scrapped in favor of those with a more meaningful human geographic scope.

In the unit headings, although much material of a physical geographic nature was included, the entire outline is slanted toward cultural geography or human use. This is done primarily to remain consistent with the background and preparation of the high school social studies teacher and the usual place of geography in the secondary curriculum—among the social sciences.

THE PLACE AND PROBLEMS OF GEOGRAPHY INSTRUCTION AT THE AIR FORCE ACADEMY

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TO UNDERSTAND the place and problems of geography instruction at the Air Force Academy, it is necessary to first become acquainted with the entire academic curriculum. To facilitate such presentation, this paper is organized into five major sections, namely:

I. Mission of the Air Force Academy and Prescribed Academic Curriculum
II. Why Geography Instruction at the Air Force Academy?
III. Geography Courses at the Air Force Academy
IV. Air Force Academy Curriculum Enrichment Program
V. Problems of Geography Instruction

Mission of the Air Force Academy and Prescribed Academic Curriculum

The mission of the Air Force Academy is to provide instruction, experience, and motivation to each cadet so that he will graduate with the knowledge, character, and qualities of leadership essential to his progressive development as a career officer in the United States Air Force. Our prescribed academic curriculum is designed to support this mission. Today's military leader must not only understand the fundamentals of technology behind his weapons, he must also understand the people of other nations and the human values which justify his existance as a military man. His education must not be narrowly specialized but must be broad enough to support future graduate work. Because of these tenets, the prescribed academic curriculum of the Academy is balanced between the physical sciences and the social sciences-humanities.

Why Geography Instruction at the Air Force Academy?

The answer stated very simply is that geography is education for survival. Among the major problems in the world

today, there are two that a working knowledge of geography will help solve. These problems are:

(1) The need of enough knowledge about the earth and its physical features to enable man to understand and adjust successfully to its forces and natural resources.
(2) The necessity to learn more about other people and nations so as to better understand their problems and their way of living.

Dr. Richard Hartshorne, once President of the Association of American Geographers and a member of the Air Force Planning Board, said this concerning the particular need an Air Force officer has for geography:

> Any specific operation of the Air Force is concerned with particular countries as regions of the world. A good working knowledge of the major differences among the different areas of the world is therefore essential to intelligent operation. Air Force officers will have an opportunity to see and be required to operate in many parts of the world. To make intelligent use of observations will require an understanding of the relationship of the various physical and cultural features.

The dynamic nature of geography makes it an academic discipline of vital importance, particularly to the military man in this world of cold wars and international tensions. Air Force activities of all kinds are conducted in particular places, and the success of any given undertaking depends in considerable measure on the flexibility with which the requirements of these activities can be adjusted to meet the physical and cultural conditions that exist.

Geography Courses at the Air Force Academy

The mission of the Department of Geography is to provide the cadet with knowledge of earth representations and world geography as a foundation for the study of other social sciences which, in conjunction with the whole curriculum, will enable him to pursue effectively a career in the United States Air Force. To accomplish this mission, the Department of Geography conducts two prescribed courses and one enrichment course—Political Geography—which will be discussed later.

The major prescribed geography course is *World Geography*. This course alternates with Human Physiology and is taught to half of the freshman class during each of the fall and spring terms. The geography course is designed to develop an appreciation and understanding of the physical and cultural differences of the world and interrelationships between them and to provide a basis for evaluating the present and future influences of geography on world affairs.

The second prescribed course is *Elements of Cartography*. Taught during the May term, this course develops facility in the use and interpretation of the natural and cultural detail on maps and photographs and is concerned with mapping control, spheroids used for mapping, geodetic considerations affecting missile accuracy, map projections, position referencing systems, and photogrammetry. This course is an academic approach to professional material that the cadet will get nowhere else. Its principles are utilized subsequently by several other courses.

Air Force Academy Curriculum Enrichment Program

Contrary to the views of some, cadets are not "put through the same mill." Our academic program is flexible. We put great emphasis upon the discovery and development of talent and ability and provide opportunity to develop those talents and abilities through a program of elective courses known as the Curriculum Enrichment Program. Basically, the program offers participants the opportunity to specialize in undergraduate and graduate courses or to broaden their general education through elective course offerings.

This program was put in operation in the spring term of 1957 and has been advertised in our last three annual catalogs. Cadets participate voluntarily in the program in any one or all of three methods—validation, acceleration, and overload.

As an incentive to participate in the program and to conform to Air Force educational needs, cadets can major in one of four areas: Basic Science, Engineering Science, the Humanities, and Public Policy. These majors are so designed that capable students with no prior college preparation can complete a major through participation by the overload method alone. Cadets who are able to participate in the Enrichment Program through validation and acceleration as well as by the overload method have the opportunity to add additional breadth or depth to their education beyond the Majors Program.

The Major in Public Policy can be obtained by completing any six of the following Enrichment Courses for a total of 15 credit hours:

Course Title	Credit Hours
Comparative Economic Systems	2½
International Economics	2½
Political Geography	2½
Public Finance	2½
American Constitutional Law	2½
International Law	2½
Sociology	2½
Political Parties	2½
Political Theory	2½
Modern Political Thought	2½
Public Administration	2½
International Organization	2½

Political Geography is appropriately within the specialized field of the political scientist who is concerned with the continuing political relations among nations. Generally, the factors responsible for national objectives are geographic in nature. These factors comprise the physical geography, cultural background, natural resources posture, and domestic economics. The stability of boundaries and vicinal location of world powers are additional contributing factors. The recently emerged "bi-polar" political world has created a scramble for the neutral, uncommitted, or idiologically complacent members of the community of nations. The identification of those among this group of nations who would prove an asset in the cold war is perhaps best accomplished through the media of the social sciences. We have discovered, as a nation, that money and credit alone scarcely guarantee allegiance of these nations to their benefactor. A comprehensive understanding of and a genuine sympathy for these nations and their problems through personal contact has apparently provided firmer ties between us. Bearing in mind the recent history of international politics, several questions—analytical in nature—appear germane. Would our national commitments abroad have been more satisfactorily executed if we had possessed a better understanding of the peoples to whom we are now pledged? Could our foreign economic aid have been more beneficial if we had known more about the domestic resources of the recipient nations? Can the strategy of maintaining world peace benefit from a broader understanding of the cultural ties, historical conflicts, and aspirations of the world's nations? Military officers are vitally concerned with these questions since these non-military matters often prescribe the parameters of military policy and operations.

Problems of Geography Instruction

Most of you, I am sure, are familiar with the congressional system of appointing cadets to the service academies. Those who enter an academy are required to complete its prescribed curriculum before graduating.

Cadets purchase some of their instructional material; some is reproduced locally. Equipment used for teaching is budgeted for and ordered by individual

academic departments. Our library of over 103,000 holdings includes a Map Room which alone contains over 2,000 geography reference sources.

Almost all instructors at the Air Force Academy have at least a Masters degree in the subject they teach. Currently assigned to the Department of Geography are officers from the graduate schools of the Universities of Illinois, Oklahoma, Pittsburgh, Minnesota, and Iowa; Pennsylvania State University, Florida State University, Syracuse University, and the Yale School of Forestry. Scheduled to report this summer with his Masters degree is one officer from Rutgers University and another with his Ph.D. from the University of Nebraska; one officer is currently working for his Ph.D. at Ohio State University; two of our instructors are scheduled to start their Ph.D. program this summer at Indiana University and at the University of Washington. At the termination of their four year tour of duty at the Academy, these officers will pass back into the line of the Air Force and continue working in their career fields. Their places at the Academy will be filled by other officers trained in a similar manner.

With this introduction, I think you will agree that we have no problems with regard to plant facilities or to obtaining students, instructors, or instructional materials. Of major concern, however, is the relationship between the time available for geography instruction and the state of geography training in the educational background of our entering cadets.

To illustrate this, I would like to cite the results of a study made of the present freshman class (Class of 1963) with regard to their prior geography training. The initial enrollment of this class was 748. Of these, 248 attended college for some period of time before entering. An examination of their college transcripts revealed that one cadet had taken two semesters of geography courses and only six had a record of one semester of geography. None of the 748 had a year of high school geography; more than half had a semester course in social studies in junior high school which may have included some geography. There was no noticeable lack of background in English, history, or mathematics. If this data on a typical class from schools in all of our states is any criterion, all of us are confronted with one simple fact: Geography is a neglected subject or is relegated to a second-class role in most American secondary schools and colleges. Because of this, most of our cadets upon entering do not know what kind of people live in different regions of the world, why some regions are focal points of controversy, or what the climates, products and resources of these regions are. Because they do not know, they cannot understand what is going on in the world. Our task is not to produce geographers but rather to enlighten these areas of near or complete ignorance.

It is quite obvious that the Department of Geography alone cannot accomplish this task in the time available for geography instruction. The real value to be gained from studying geography in a general educational curriculum is the ability to apply geographical knowledge to a situation and make logical deductions and positive assertions. The world is not merely a collection of factors or conditions, but a series of processes. Yet the brevity and sequence of our present geography courses compels us to deal mostly with factual information; thus there is little time to employ the methodology of geographic analysis in the classroom. For this, we must rely on other disciplines within the social science-humanities areas. We are striving to produce educated and dedicated public servants. If the Ameri-

can people are willing, we shall succeed; for, in the words of Isaiah Bowman, "The first condition of high achievement is thorough preparation. The second is painstaking and resourceful execution when the inevitable difficulties arise. The third is perseverance."

THE PHILIPPINES—PURGATORY OR PARADISE?

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AS A NATION with a long, distinguished, and varied cultural history, politically free only recently, the Republic of the Philippines shares many of the same problems and aspirations of her newly independent sisters. All are nations with great expectations. Most have been seduced by their planners into believing that their lands could support many more inhabitants in much better fashion than at present. Most scientists and social scientists, native and foreign alike, who have examined the Philippine scene, have seen great potential for future economic development.

Significantly, however, economic growth is not now keeping pace with a steep, upward-spiralling population curve. Births exceed deaths by 300,000 persons annually, and population is expanding at an increasing rate. Resource use currently exceeds resource replenishment.

The sad record or impoverishment cannot be verified completely, but much presumptive evidence is at hand. Any reasonably objective observer needs only to view the steady encroachment of cogon grass, to observe the impoverished fields and downtrodden farmers of Cebu, Bataan, and elsewhere, and to see the eroded slopes and sickly crops in steep lands almost everywhere to realize that the overall agricultural situation is not materially improving; indeed, that it probably is deteriorating. The spectacle of basic foods importation in about three years out of five for a nation which professes ability to feed three or four times its present population is ludicrous.

Two antithetical camps argue vociferously about the status of Philippine forests. Optimists in the Bureau of Forestry point to present ratios of cutting to regrowth as indicating that Philippine forests will persist forever. On the other hand other foresters point to current decimation of forests with alarm, and some suggest that Philippine forest resources may be depleted in a generation or two.[2]

Philippine fishing grounds are good, but exploitive fishing techniques and pollution threaten decline of existing fisheries. Manila Bay has become so polluted that it is unsafe to consume sea foods caught there. Laguna de Bay has been so badly overfished that fish life has *completely* disappeared from the lake. Dynamiting of fish, widely practiced, not only has deleterious effects on the aquat-

[1] Although the author was Fulbright Professor at the University of the Philippines (1958-59) the opinions contained herein are his own and in no way reflect the opinions of the United States Educational Foundation or of any person, other than the author connected with the Fulbright Program or the JOURNAL OF GEOGRAPHY.

[2] Several experts in the Bureau of Forestry expressed a very optimistic viewpoint during conversations with the author in mid-December, 1958. Shortly before that Professor Reyes (Professor Emeritus of the U.P. College of Forestry at Los Baños) was very concerned about the present conditions of forestry in the Philippines. He was *very* pessimistic about the future if present attitudes and practices persisted.

ic community, but often results in tragic human accidents.

National Planning

To date national planning has been marked by an ineptness that is distressing. Fundamentally, planning shortcomings may be attributed to lack of a basic inventory of available resources. Resettlement failures in Palawan, Cotabato, and elsewhere are directly traceable to inadequate knowledge of pioneer areas. The obvious first step in any sound economic program is an inventory of what's on hand. In the absence of such an inventory, however, certain basic facts seem abundantly clear.

The physical environment of the Philippines is something less than outstanding, but nature has not been niggardly in her endowment. An adequate climate, coupled with sectors of good agricultural soil, afford significant agricultural opportunities. Magnificent forests, composed of useful species, are an invaluable asset. Metallic minerals, particularly iron ore, chrome, copper, and gold, are found in modest, though significant amounts. Tourist possibilities are astronomical.

Sugar, abacá, coconuts and copra, rubber, spices, tobacco, and cacao could all play more significant roles in the economy than they now do. However, since preferential treatment in the American sugar market will be withdrawn in the not too distant future, the Philippines must look to other markets, probably Asian, for sale of this commodity. Abacá faces rigid competition, because of the entrenched position of other coarse fibers and the increased use of synthetic fibers. A new emphasis upon the sale of abacá items, such as place mats, jusi fabric, etc., could, however, rejuvenate this industry. The sad estate to which Philippine coconut and copra production has fallen is a national disgrace. The Philippines, with more bearing trees than any other nation in the world, is taking such poor care of the trees, lagging so far behind in basic coconut research, and producing such low quality copra that her world stature in coconuts and coconut products is declining. A few rudimentary measures would so increase yields and improve the quality of the product that the Philippines could easily show a marked expansion of this industry.

Rubber demands will continue to expand around the world, and, because of climate and soil conditions, the Philippines is in a position to capture a portion of this expanding world rubber market. Spice production could be greatly fostered on small areas, providing capital is available. Cigarette tobacco in quantities sufficient to meet local cigarette manufacturing demands could be produced with an exportable surplus of cigars and cigar tobacco. Cacao could be produced in large volume in an environment, which is at present notably free of cacao diseases. The production of fibers, such as cotton and ramie, is practical and may merit some serious attention. Fruit and vegetable acreages could be greatly expanded for nutritional benefit.

A more complete use of wood residues, bagasse, and bamboo should put the Philippines in a position of practical self-sufficiency in paper. Indeed, with diligent efforts the Philippines could become an exporter of paper products and a significant manufacturer of cellulose plastics.

Complete smelting of certain minerals, formerly exported as ores or concentrates, would have a beneficial effect on the economy. Fish canning would yield a saleable product, particularly in the Asian market.

Tourism is potentially big business. At present, however, appropriate hotel facilities and restaurants are so inadequate as to be almost non-existent outside of

Manila. Inconveniences occasioned by long delays in customs, unrealistic exchange rates, and exit problems all contribute to antipathy on the part of many, who otherwise would spend countless sums enjoying the natural beauty and charm of the Philippines.

Handicaps and Limitations

Handicaps in the Philippines are more numerous than ardent nationalists or friends of the Philippines would like to believe. The most significant handicap at the moment is a rapidly expanding population. Philippine economic development requires a semi-moratorium on population expansion. That this is a difficult, perhaps impossible, task in a Catholic country is obvious. Unless rapid population expansion is checked, however, there is little likelihood of achieving economic progress at a rate commensurate with population growth.

Another serious handicap for future economic growth is the lack of sufficient quantities of fuel. Coal supplies are inadequate, and petroleum is an unknown quantity. Water power development is negligible. The great hope of the Philippines is to make the jump from fossil fuels directly to fission, fusion, or solar energy. While this is a hope for the future it is not a panacea for the present.

Soil resources in the Philippines vary greatly in quality from place to place, but the soils are much less productive than commonly believed. Poor soils mean poor people, and most rural Filipinos are poor. Only more intelligent use of the land and increasing application of fertilizer can reverse the trend of soil impoverishment.

Malnutrition, parasites, and disease combine to lower the drive of the average Filipino, and therefore reduce his efficiency. Polluted water supplies, insect borne and contact diseases, and the insidious effects of low vitamin-low mineral diets combine to debilitate the population. Improved, though still not good, sanitation has lengthened life expectancy, but many live out their lives physically under par.

Certain human attitudes and values combine to create a most difficult situation. An attitude of servility among many Filipinos prevents them from accepting an economic challenge in the face of limited security enjoyed through the questionable benevolence of the wealthy. Usury is rampant; many labor from the cradle to the grave in abject poverty. Unfortunately there is a tendency among intellectuals and those in government to express great interest in a project, to launch it, and then allow it to die.

A political climate, which is something less than stable and mature, repels foreign investment, and fails to come to effective grips with the real problems of the people. A nationalistic reaction to colonial times results in a seeming inability to distinguish between legitimate nationalistic aspirations and undeserved recriminations against the U.S. Pulling the Eagle's tail leads to misunderstanding of motives and to financial repercussions.

Peace and order, while greatly improved over the situation of 1950, still leaves much to be desired. The Huks are reduced in numbers and are kept at bay, but they have not been eradicated. Crimes of violence bred by misery and poverty are common in large cities. Police and constabulary forces are not adequate in numbers to completely cope with the crime situation.

Philippine problems must be solved by Filipinos, and assistance should be offered only on request. Foreigners, particularly Americans, should not be patronizing on the assumption that Americans know how to live better than anyone else. On the other hand Filipinos must get over sensitivity and hurt pride. Philippine problems must be examined

objectively by Filipinos in a completely dispassionate mood. The way to Philippine prosperity and progress is not an easy one.

Their Population Problem

A solution for a major problem must be found immediately or there will be no measurable rise in the standard of living. Dignified man will continue to suffer indignity, and human values will be eroded unless something is done now. A population probably already exceeding the optimum is expanding at an accelerated rate in an environment which is essentially an unknown quantity. This is like lighting a fuse to a keg of dynamite. *The problem* is that there are too many people living on too little land of *unknown* quality.

The obvious solution to an expanding population is birth control. *Dogmas do change,* and it is my firm conviction that the Filipinos, when confronted with overwhelming evidence of the deleterious effects of over-population, will change or modify their stand. If contraceptives, birth control pills, and similar "artificial" devices continue to be taboo, then appropriate agencies must begin a mass education of the population in the so-called natural methods of birth control. Curious as it may seem, rural electrification and the introduction of recreational facilities have a stabilizing influence on birth rates. It is absolutely essential that the *Philippine population* be stablized, or at worst, that the annual increase does not exceed .1%.

Inventory Needed

Stabilizing the population accomplishes nothing unless basic inventories of existing resources are taken to assure optimum utilization of such resources. An aerial photographic survey of the entire national territory is a logical first step. These photographs furnish the essential tools for photogrammetrists to provide detailed topographic maps of the country. In the hands of skilled foresters they provide an accurate and detailed inventory of forest resources. Geologists use them to locate important economic mineral deposits. Geographers, pedologists, land economists, and agricultural experts find the photographs valuable tools in mapping soils, terrain, culture, and land use. With such basic inventories in hand, new patterns of land use—better suited to the environment—would emerge; resettlement and land tenure schemes could be undertaken with confidence; and transportation routes, communication facilities and public utilities could be constructed with a real knowledge of need. These land inventories are *basic;* without them progress is unlikely.

With an assumed population moratorium and a basic inventory in hand, or well under way, other progressive steps are necessary. Manufacturing must be fostered. Food processing, which has already made an encouraging start, can be greatly expanded, and quality controls should be instituted which will enable the Filipino produced commodities to adequately compete with imported brands. Tropical fruits and other products, *attractively packed and well advertised,* would find a ready market in Europe and North America. Plastics; textiles; cement, clay, and glass; tobacco; chemicals; and wood products manufacturing can all profitably be expanded.

National Planning

How may such a program of population stabilization, agricultural diversification, and manufacturing expansion be implemented? A national planning board, with professional planners, must be given almost unlimited powers in recommending legislation, granting or denying appropriate permits, and embarking on large scale

advertisement of Filipino products.[3] This agency should control subordinate agencies dealing with the production and marketing of basic commodities.[4] Transportation facilities, both rail and highway, must be greatly improved to provide appropriate farm-to-market access. Police and constabulary forces must be put above politics, and officers and men must be paid a living wage to minimize temptations for corruption. A crash program of health education must be implemented at the barrio level to reduce the debilitating effects of parasites and disease. National and local officials must produce such a climate of honesty and service that graft and corruption, instead of being assumed, will be almost unheard of. Soil conservation agencies must be supported with generous appropriations to reduce the ravages of erosion, and agents must assist in insuring that the farmer can wrest higher yields and a better living from his land. Government employees should be placed in civil service with normal merit wage increments. Excess governmental employees should be eliminated and patronage positions should be greatly reduced in number. These measures, and others, should be undertaken at the national and local level in a coordinated way.

[3] The National Economic Council is theoretically doing this job now, but its efficacy is limited because of bureaucracy, lack of appropriate coordination with other agencies, inadequate budget, and limited training of certain of the upper echelon people.

[4] NARIC has failed to accomplish the role intended for it, partially because of inadequate support and lack of public confidence.

Conclusion

With a stabilized, or very slowly growing population, possibilities for rapid economic improvement in the Philippines are present. Whether such possibilities are realized is contingent upon whether the Philippines is guided by decision rather than indecision, direction rather than indirection, self-denial rather than self-indulgence, courage rather than weakness, and a high sense of public purpose rather than public apathy. It's up to Filipinos whether the Philippines becomes—Purgatory or Paradise.

PLACE NAMES AS A TEACHING DEVICE IN GEOGRAPHY

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PLACE-NAME GEOGRAPHY is an important, but often neglected, aspect of the discipline. It can be used as a research tool in historical or settlement geography or it can be presented as a distinctive research field in itself. In addition to these functions, however, we often forget that place-names can serve as an excellent tool for the teaching of geography at virtually all levels of learning.

Place names, often considered strictly historical rather than geographical in nature, are by no means ignored in many of the prominent geographical and historical texts. Such names as Leadville, the Rocky Mountains, Great Basin, Death Valley, Staked Plains, and Council Bluffs are often explained in interesting and helpful manners. Place names thus may assume varying degrees of importance, depending on the teacher and the textbook, as "side issues" in the teaching of social science subjects in our elementary and secondary schools.

The purpose of this article, however, is to stress the use of place names as a

primary geographic teaching device. Entire lessons or even units can be based upon a place-name foundation which often provides one of the most effective means of motivating the students. Methods and place-name examples will here be slanted primarily to the elementary and secondary levels. The use of place-names as a research and/or instructional tool in the teaching of college geography classes is more widespread.

Place names may have many different types of geographical significance—some obvious, others rather subtle. One of the most generally considered uses of place-names is the indication they may give of the nationality or linguistic backgrounds of cultural groups who have settled a particular area. An introduction to the settlement and population geography of the United States might very easily begin with the emphasis of the various types of linguistic place names in the nation: French in the Louisiana and Gulf region; Spanish in the Southwest, California, and Florida; Russian in California; American Indian in various sections.

Place names may also indicate features of the physical landscape. Investigation is easily fostered by the noting of such names as Cedar Falls, Marshfield, Forest County, Lake of the Woods, Finger Lakes, Presque Isle, Pine Bluffs, Chicago Heights, or Great Salt Lake.

Economic features may find expression in names like Oil City, Portage, Grass Valley, Quartzburg, Claysville, Carbon County, Steelton, Glassport, or Minersville. An almost endless array of such place names may be found on a world-wide basis: Spice Islands, Gold Coast (now Ghana), Ivory Coast, etc.

It would be well to indicate, early in the use of place names in teaching the geography of an area, that such names do not always "tell the truth" about a geographical feature. Perhaps the best example, on almost any level of instruction, is that of New York's East River. Most students will be surprised to find, upon examination of a fairly large-scale map, that the East "River" is *not* a river! This example will serve more than one purpose in teaching a unit in that interest will be aroused with the possibility of such "deceptions" and students will no longer make the mistake of accepting all geographical place-names at "face value." Also, a natural introduction to library research, for the sake of corroborating apparent place-name "finds," will be afforded.

Place names are especially valuable in the teaching of geography due to the ease with which they may be used for geographical units of virtually any scale. Continents or countries, such as North America or the United States, are obviously quite suited to such treatment. Place names can be used just as readily, perhaps more so, with individual states. For example, a small but varied selection of place names for the state of Pennsylvania is given below. The complete versatility of geographic place names is proven by the ease with which local or "home" areas may be studied. Virtually every community or small political unit (county or township) supplies such "ready-made" names as Oak Park, Willow Grove, Stony Creek, or Indian Spring.

A SAMPLE LIST OF PLACE NAMES FOR THE STATE OF PENNSYLVANIA

Glassport	Quakertown
Millvale	Elk County
Carbon County	Laurel Hill
Coalport	Port Allegany
Mechanicsburg	Ridgeway
Holidaysburg	Forest City
Homestead	Old Forge
Three Springs	Jim Thorpe
Allegheny Front	Clearfield
Portage	Oil City
Steelton	Claysville
Freeland	Germantown
	Safe Harbor

A very brief bibliography of place name books suited to elementary and

secondary school geography teaching is provided at the conclusion of this article. Similar volumes may be found in your school or public library (usually under the subject heading: Names—Geographical) with the most common call number under the Dewey Decimal System beginning with 929.4. The value of place names as a tool for geographic education is limited only by the interest and imagination of the instructor.

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COFFEE CAN ANEROID BAROMETER

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OFTEN the geography teacher, in teaching weather and climate, faces a problem in demonstrating the facts of air pressure to the student—the fact that air has weight, that air masses of different weights are moving over him constantly, that instruments can show the changes, and that correlations between air pressure and weather exist and can be discovered.

The teacher who finds it impractical to make a mercurial barometer might choose to make, or to have the class make, a coffee can aneroid barometer. Such a barometer was recently made and demonstrated by Mr. Joseph Intlehouse and his science class in the public school of Milnor, North Dakota. The accompanying picture shows Mr. Intlehouse with the Intlehouse barometer (Fig. 1).

The following are pertinent facts relative to the instrument:

Materials Required

One piece of wood ¾″ thick and 24″ long by 6″ wide for the base

One piece of wood ¾″ thick and 8″ × 5″ for the scale

One round piece of wood about ¼″ in diameter and 20″ long: sharpened at one end for the pointer.

One piece of wood approximately ½″ × ½″ by 6″ (post for pivot pointer)

One piece of stiff wire about 3″ long

Eight small screws

Unopened tin of vacuum packed coffee

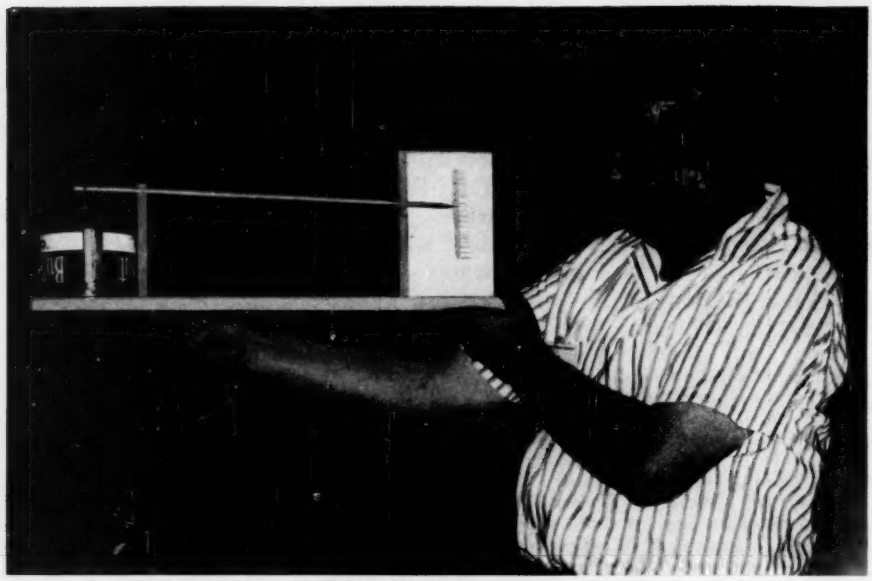

FIG. 1. Joseph Intlehouse and his coffee can barometer.

Assembling the Barometer

1. Fasten the unopened coffee can firmly to one end of the base with four screws spaced snuggly around the circumference of the base.
2. Bend the key up in a vertical position, and re-enforce the bend of the key with a little solder for more strength.
3. Fasten the 6″ post in a vertical position at the edge of the tin near the center of the base as shown in the picture.
4. Drill a hole about 3½″ from end of the pointer and fasten the pivot pointer on a screw passing into the vertical post.
5. Connect key and end of the pointer by a stiff wire so the pointer is approximately horizontal.
6. At the end of the pointer and parallel to it, fasten the 8″ × 5″ piece of wood in a vertical position close to, but not touching, the pointer.
7. Fasten a small sheet of white paper to the vertical 8″ × 5″ piece of wood for a scale.
8. The instrument can be calibrated by comparing its readings with readings of other barometers and preparing a numerical scale.

How the Instrument Works

It will be noticed that if one presses lightly on top of the tin can the pointer will be pivoted upward due to the increase in pressure. Since the can is a partial vacuum, increase in air pressure will cause the pointer to rise and likewise a decrease in pressure will cause the pointer to fall.

How to Use the Instrument

Increasing air pressure up to a high reading usually indicates fair weather, and a falling barometer usually indicates bad weather. The student will soon learn that this is not always the case, and that it is better to associate the changing barometric pressures with other weather

signs such as: wind speed and direction; temperature; humidity; cloudiness, etc. For instance, one will often find that when the wind is steadily from the south or southeast for a reasonably long time with a falling barometer, rain is very likely to occur.

A PROGRAM OF GEOGRAPHIC EDUCATION FOR GRADES 4 THROUGH 6*

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THE SPACE AGE dawned on October 4, 1957. How many orators at how many teachers' meetings have opened their speeches with this statement? If all these speakers and all the teachers who have patiently listened to these words were laid end to end, they would form a great circle around the earth.

A few years ago educators and laymen were discussing "Why Johnny can't read." Today speakers at Rotary Clubs as well as at P.T.A., and writers in the *Saturday Review* as well as in the *NEA Journal* are turning to such questions as "Are we educating Johnny for the space age?" and "Are we giving Joanne a horse-and-buggy education in the jet age?"

The jet age has arrived with the space age. This new age has also been called the atomic age, the age of new metals, the synthetic age, the electronic age, and the push-button age. Another name for it is the chemical century. All of these labels indicate the effect of changes made by man's advancing scientific knowledge —changes in the routine of daily life, changes in man's economic activities, and changes in the interrelationships between man and the earth.

So here am I, one more person discussing the changes and challenges in this world today. But I am not dealing with the effect on the entire curriculum and on all educational practices. I am attempting only to point out the significance to the content, concepts, and values of geographic education for grades 4 through 6. Even limited to that objective, mine is a formidable task. As a beginning, let us select and examine some of the changes taking place in the world today that may well affect the nature of geographic education.

Changes and Challenges in the World Today

Serious scientific talk of sending messages from London to Honolulu by bouncing them off a "communications satellite" startles us, but devices that once were equally amazing are now accepted as commonplace in our everyday lives. To Johnny and Joanne, life without telephone, radio, or television is in the same distant past as life with smoke signals and talking drums. Recent studies in the Chicago area show that Johnny and Joanne and all other children in grades 2 to 6 spend an average of more than 22 hours a week in front of a television set.

Mass media of communication bring numerous experiences within the range of children. The fare is varied. They see excellent documentaries on such subjects as Antarctica and atomic power. But they also follow adventures that take place on the hilly streets of San Francisco, among the rocky canyons and forested slopes of Utah, or in a permanently snow-covered Yukon. In all these places

* Read in part at the Annual Meeting, National Council for Geographic Education, New York City, November 28, 1958.

the people seem to be engaged only in breaking the law or in running down law-breakers and never in performing an honest day's work.

In addition to television and radio, printed materials such as newspapers, magazines, and children's books provide a vast amount of fascinating information. If Johnny and Joanne can read, and also can see and hear, and if they are at all alert, they can gain a large amount of incidental information, some, we should record, true and some entirely false or dangerously half true.

One of the developments of great importance to geography and geographic education is the shrinking of the world with the coming of the jet age. Of course, the jets did not introduce rapid transportation. Already synchronized were the tempo of our lives and the speed of trains, automobiles, and airplanes. The flight of the jets over the Atlantic was only a stage in a development that began centuries ago. We still sing sentimentally about "far-away places with strange-sounding names" but actually few places are far away in travel time.

The shrinking of the world by the development of rapid transportation and communication has brought an increasing interdependence among places and peoples. When political tension develops in any place in the world, we watch and wait with anxiety. Our modern civilization depends on materials garnered and gathered from many parts of the world. Johnny and Joanne, the children of whom we are thinking, live in the United States of America but have the whole world as their home.

Scientific discoveries and technology affect our lives in many ways. In this push-button age, a flick of the finger floods a room with light, operates an automobile, brings music into the home, and starts the washing machine. In this chemical age, we break down substances, recombine and re-form the parts, and come out with plastics, rubber substitutes, and miracle fabrics. We develop new fuels and new heat-resistant alloys required by jets and rockets.

The search for new materials, begun in the laboratory, extends over the earth's surface. Discoveries bring little-known corners of the world into new importance. Railroads penetrate the wilderness. Airports and construction camps begin to dot the empty lands. Factories spring up out of mud holes and cornfields. The bulldozers, drag lines, and tampers are at work, and new dams, mines, dumps, reservoirs, and cloverleafs are changing the face of the earth.

The world in which Johnny and Joanne are growing up will differ from the one that we know, not only because of changes brought by science but because of the increasing number of people that live in it. The birth of Joanne who will enter the fourth grade some years from now may be the one that sent the population of the United States to 175,000,000. This will mean more children in school, more cars on the highways, more spreading suburbs, more people to make use of our natural resources.

The chances are very good that Johnny and Joanne will be city children. Today one out of every eight persons in the United States lives in a city of more than a million inhabitants, four out of ten in cities of at least 25,000, and eight out of ten live within 25 miles of such cities.

The Significance of These Changes to Geographic Education

These are some—certainly not all—of the changes that are of significance to the development of a curriculum. What effect do these aspects of change in the world today have upon the content of geography? Of what importance are they to a program in geographic education for grades 4 through 6?

At one teachers' meeting, an educator, talking about curriculum needs, told the story of a boy who was dilly-dallying over

his breakfast one morning. His mother who was having difficulty getting him started off to school pressed him about his lack of interest. "What's the matter?" she asked. "Usually you can't wait to get to school." In answer the boy explained that he was bored with school because the class was making a farm when he wanted to build a rocket.

What was the point of this story? Does education for the modern world mean that we must omit the old, familiar topics related to the earth on which we live to make room for the exciting and new science of the space age? Are changes in geographic education needed to keep it vital and keyed to the times?

The increase in urbanization, the "Exploding Metropolis" of *Fortune's* survey, affects the content of geography in several ways. For one thing, it dictates increased attention to the geography of cities. The urban child needs to feel at home through an understanding of things around him. He needs to know where he is, not only in terms of streets and the location of home and school, but where he is in relation to the functional parts of the city—the industrial area, the business district, the residential areas, the lines of transportation.

Not only the urban child, but all children, should learn more urban geography. It is no longer enough for children to memorize the locations of important cities and their major products. Children should become familiar with the kinds of work carried on in cities, the importance of transportation to the life of a city, and the interdependence of city and country. They need to know some of the factors that encourage the growth of urban centers. For each of a selected list of major cities they should study the advantages and disadvantages of the situation, the pattern of the city in relation to the site, and the characteristics that give it personality.

This emphasis on urban geography does not mean that the rural child need not become familiar with his immediate environment. All of us have long recognized the importance of the study of the home locality not only because it is essential in the development of an educated person but also because it provides fundamental background experiences necessary for an understanding of places never to be visited and activities never to be seen.

Increasing urbanization removes children from contact with the natural environment and gives rise to another requirement for modern geography. Urban children draw water from faucets and buy food and clothing at stores. Thousands of them walk daily on concrete pavement and seldom see or touch the earth itself. If these children are to have any feeling for the value of resources, as for example, for the importance of the water supply, experiences must be provided that will help them understand not only the source of their water or milk or bread or books or raincoats, but also the long chain of workers between the source and the consumer. It is evident, therefore, that geographic education retains the responsibility for teaching how and where wheat is grown, iron ore mined, wood made into paper, and many other such topics traditional in the content of geography.

Urbanization and the increase in population together make the effective teaching of conservation of natural resources more important and at the same time more difficult. The urban and rural child alike should study the natural resources of the home area—water supply, petroleum, soil, beautiful scenery, or whatever they are. This study should result in the personal involvement of the child. Let it be an emotional involvement so that he feels disturbed at litter in the park or at muddy water in the roadside ditch. Only then will the presentation of facts about conservation have deep meaning for him. Science has not freed us from dependence on the earth.

However, science has, as we have already noted, brought many changes in geography, changes in sources of materials and products, in areas of production and consumption, and in methods and routes of transportation. Added to these changes are others stemming from social and political factors. Our coca-cola civilization has penetrated into the deserts and forests. Political boundaries have shifted. Old, familiar names have disappeared from the map. New nations have come into being.

The content of modern geography recognizes these changes. It includes materials that contribute to the understanding that geography does change. Children in grades 4 through 6 can see that man's changing needs, knowledge, and skills have made possible a fuller utilization of natural resources and that the influence of the natural environment varies with the stage of man's development. The geographic content should, therefore, emphasize the role of man and the dynamic nature of geography.

The continued shrinking of the world, the increasing interdependence of all its parts, and the developments in many areas once considered of little consequence mean that few places can be ignored. What part of the world can we omit from our study? The answer is difficult to find. As we consider the problems of today, we realize the knowledge of the world, yes, the entire world, grows more and more vital to all of us.

We have previously discussed the incidental learnings acquired by Johnny and Joanne from radio, television, movies, books and magazines. How much do these incidental learnings contribute to geographic education? Are they sound enough and numerous enough to help us in covering the content of geography? Certainly information gained this way cannot be ignored. It provides children with some facts and a considerable amount of understanding. On the other hand, information gained in this way is seldom common to all children and cannot be counted on to cover certain topics. At worst, it is inexact, incomplete, and sometimes entirely misleading.

Geographic information that is gained incidentally is at best fragmentary. If the reader or observer possesses a framework on which to place the bits and pieces, the fragments will fill in and embellish the bare frame. If not, his information will remain incomplete and unrelated to the whole pattern. Incidental experiences will have full value only if a sound foundation has been provided by a comprehensive geographic education. This geographic education should be broad in scope and arranged into a sequence of experiences which will provide that a child moving upward through the elementary and secondary schools will cover the essential aspects of geography according to a plan which recognizes the interest and capacities of children at various levels.

A Program in Geographic Education

What then should be the scope and sequence of geographic education in grades 4 through 6?

Our brief survey of changes in the world today pointed out that the geography of 1960 is not the same as the geography of 1950, and that the geography of 1970 will differ even more. This indicates a need for up-to-date subject matter and for a modern emphasis in geographic instruction. Our survey also brought out the increasing value of geographic understanding for all citizens. This shows the importance of wider scope and greater depth in the program of geographic education. In addition, this survey emphasized the changes taking place in the lives of children and the resulting need for a well-planned course of study that will recognize the experiences, interests, and needs of Johnny, Joanne, and all other children of the space age.

The organization of a program in ge-

ography is a growing problem because of the increase in the amount of material that seems desirable, even necessary. Any solution of this problem includes careful planning to prevent overlapping and to provide for continual growth in skill and understanding. A program for grades 4, 5, and 6 must be an integral part of a program in geographic education for grades 1 through 12. Plans for any one of these levels should not be made without due regard for all. The work of each grade builds on work that goes before and contributes to learnings that come after.

The program in geographic education can be carefully built to insure vertical integration. Threads of knowledge and skills should be traced through the various levels of experience until they are woven into a fabric of broad geographic understandings. For example, a fourth-grade study of a fishing village on a harbor near the fishing grounds, a fifth-grade study of a trade center in a rich farming region, a sixth-grade study of a manufacturing town at a hydroelectric power site—all contribute to the understanding of the factors that encourage the growth of towns and cities.

One aid to coverage of an adequate amount of geography in grades 4 through 6 is the introduction of pre-geography understandings and some simple geographic concepts in grades 1 through 3. These would include, for example, concepts related to distance, direction, neighborhood activities, weather, the progress of the seasons, and many other similar topics which furnish a background for the work of grade 4.

In grade 4 the child gains an overview of the world. This has been the plan for this level in many schools for many years. The reasons are even more sound today than in the past. This overview of the whole world gives the fourth grade child background for the intensive study of areas in the succeeding years. In addition it provides the framework into which he can fit knowledge he is gaining in and out of school. For example, the study of the globe and the world map makes it possible for him to learn and to appreciate the location of Cape Canaveral, of Hawaii, the fiftieth state, and of many other places that come to his attention through the news and through real or vicarious experience.

In addition, fourth-grade study of people living in different environments contributes understandings such as: the world differs from place to place in physical and cultural features; there are interrelationships between the kind of place and the work and play of the people; people in different parts of the world are increasingly interdependent.

The content of geography in grades 5 and 6 presents a problem, if we must consider these two grades alone. In many schools the practice is to cover the geography of all the continents in these two grades. Many teachers of the intermediate grades know the difficulty of making geography meaningful and interesting when trying to teach Europe, Asia, Africa, Australia, and Latin America in one year. If the children are to gain an adequate knowledge of the world in which they live, a study of the continents should be spread over grades 5, 6, and 7 and not limited to grades 5 and 6.

The study of the United States and Canada is well suited to grade 5 where it is traditionally placed. Most people agree that it is desirable for children to study their own country as soon as they are able to do so with a fair degree of thoroughness. In addition, a knowledge of the geography of the United States provides ten-year olds with the necessary background for the history, literature, science, and current events they are studying at the fifth-grade level.

The other continents—Latin America, Australia, Africa, Europe, and Asia—should be studied in grades 6 and 7. The southern continents might well be placed

in the sixth grade because these continents have much interest for children and are less complex than Europe and Asia. This leaves these two last-named areas, complex in physical and cultural features and in their interrelationships, for the seventh grade where children have a more adequate geographic background.

The program for the other years of the junior and senior high schools should not repeat the pattern of the intermediate grades but should build on this foundation using a fresh approach and a more advanced point of view.

It is time to come back to the children of the space age—Johnny, Joanne, and the boy who had to build a farm when he wanted to build a rocket. We can understand their fascination with rockets, "sputniks," and trips to the moon, but the study of outer space does not need to over-shadow geography. You and I know that geography, too, is exciting. We know that the story of man's relationship to the earth on which he lives contains much drama and adventure. We believe that the knowledge, skills, and appreciations that come through geographic education will help children live more meaningful and effective lives in the space age.

NOTES ON PENGUINS*

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PICTURES of penguins have appeared in so many newspapers, magazines, and books that most pupils and teachers are familiar with their appearance in a stationary position. But unfortunately many of our children have little if any scientific information about the animal geography of this interesting bird which is so characteristic of one of the large physical environmental regions of the world.

Body Characteristics and Habitat

Penguins are dressed severely in black with a white front and black feet. The young penguins wear a uniform of grey. They have extremely short legs which raise their bodies only a few inches off the ground, and they have a most ungainly waddle. When walking they are forced to take very short steps, rolling from side to side with each step forward.

Although the penguin spends more than one half of each year on islands in the Antarctic region, the land is not his habitat. Neither is the air his home, for, although he is a bird, he has no wings and cannot fly. The actual home of the penguin is the sea. Although he cannot walk or fly with any ease, he can swim very swiftly. When not visiting an island (which a penguin does only for breeding or some other definite purpose), he lives far out at sea in the southern ocean. There he swims, eating only small fish, usually a variety of sardine. When night arrives, the penguin comes to the surface —floating like a duck—and sleeps.

To travel the penguin propels himself entirely by means of his flippers, keeping his feet stretched out for use as a rudder. He has some specially designed swimming customs of his own. When Mr. Penguin dives, a transparent film comes

* Some readers may wish to reread "The Penguin and the Ostrich" by Thomas Frank Barton, *Journal of Geography*, 1939, Vol. 38, pp. 188-191. If you do not have a copy of that issue of the *Journal* and will write to Thomas F. Barton, Department of Geography, Indiana University, he will mail you a mimeographed copy.

over his eyes the moment he goes under water. To protect his ears, oil, which turns the adjacent feathers into an entirely water-proof covering, is exuded from them. When he wants to submerge, the penguin fills a little bag on the side of his throat. This principle has been adopted by man for use in the submarine.

Attackers of a penguin, the octopus and the shark, are deterred by two of the penguin's defenses—his great speed and his protective coloring. A penguin's back is black and his breast is white. A shark approaching from above would not see the back because of the darkness of the deep water. On the other hand, if the penguin were approached from below, his white front would fail to stand out against the comparative lightness of the sky-roofed sea.

Raising Young

Twice a year the penguins go to an island to mate and to rear a family. When a nest is to be built, the penguins choose a spot with sandy earth. By burrowing into the ground, they can obtain shelter from winds and storms.

To build a nest, the penguin lies down and scrapes at the earth with his feet and flippers until the soil is loose enough to be removed. Then he shifts forward and starts to kick the dirt out of the hole. In this way he gradually digs a sloping tunnel to a depth of one, two or three feet. The nest is, in effect, an open front tunnel or ditch with a roofed-house behind. Since digging is a hard job, the mates take turns, one resting while the other digs. Each day at the end of work they go down to the sea to fish and to wash.

After the digging has been finished, the penguins search for sticks to be used in lining the nest. If he can, Mr. Penguin will take twigs or roots from bushes. When this is impossible, sea weed is used as a good substitute.

Mr. and Mrs. Penguin settle down to the responsibilities of wedlock after their home is finished. The first egg comes within the second week after the mating. Its arrival causes great excitement. Mrs. Penguin gently lowers her body onto the egg so that it will remain warm under her feathers. Mr. Penguin also sits on the eggs as long and as frequently as his wife. Each potential parent sits for about twelve hours. Two or three days after the arrival of the first egg there may come another and another and perhaps a fourth. However four eggs are unusual. Two are about as many as Mr. and Mrs. Penguin can care for.

When the shell falls apart, there appears a creature which no one would recognize as a penguin. It is dark colored, rather skinny, and extremely ugly—it bears a striking resemblance to a "teddy bear."

Penguin parents are extremely busy. Each must take an equal share of the responsibilities. One goes to the fishing ground while the other acts as a guard and feeds the young penguins. The chicks at this age must be fed every twenty minutes. The parent's digestive machinery turns the food that he or she has collected into a liquid, and this liquid is brought back into the beak. The young chicks insert their small beaks into the parent's larger beak and are fed in this way. As the chicks grow, the time between feedings is lengthened to two hours. Eventually the children are strong enough to eat small fish. This beak feeding goes on for about three months.

The young penguins gradually change color, losing the appearance of dark-brown "teddy bears," and each day become more like their parents.

Then the penguins are taken to the sea to learn how to swim and dive.

Molting Problems

A period in penguin life which is miserable is the period or time of molt-

ing. While most penguins molt in December, some thousands do it at other times of the year—with disastrous results. When the penguin feels the molting period approaching, he will go frequently to the fishing grounds (ocean waters) and stay there longer to eat and to add a reserve of fat.

From the moment molting appears, the penguin is miserable. He is no longer able to dive. He is buoyed up by his own loose feathers, making him float like a cork. Since a penguin who has lost the power of diving cannot go out to sea and cannot catch fish, he must endure starvation until he is again able to swim. The penguin manages to stay alive by living on his reserve of fat.

Molting does not occur from the head downward or in any regular way. The old feathers come off in patches wherever new feathers happen to be growing. The penguin in this wretched condition will abandon his home for the open patches of sand. If a penguin molts during the nesting season, his family may starve.

At the end of the molting period the penguin will use artificial means to regain his diving ability. Mr. Penguin solves the problem of excessive buoyancy by swallowing stones.

Enemies and Habits

Penguins have a number of enemies. On the land the gull and ibis steal the eggs and young chicks whenever it is possible. In the water the penguin must always be on the alert for sharks and octopuses.

A peculiarity about penguins is that they never change their course and always walk single file over the same path. These paths are tribal paths. They lead from a nesting ground of a colony to the sea. If an obstacle is put across this path, the penguins will attempt to move it. If this is impossible, they will simply sit down and wait until the path is cleared somehow.

Even in penguin life there are "social outcasts." If a penguin is a freak bird with a white head or if he is an albino, he is scorned by the other penguins. These "outcasts" are sometimes followed and pecked by the other birds. Orphaned penguins have no chance for surviving, for no penguin other than their parents will take them in. Thus they are left to die.

Penguins have dominant "habits." They take utmost care to make and furnish homes, have constant affection for their mates, are devoted parents, have patience, courage, tenacity, endurance, and affection. They have certain established rules of life—keeping to set paths from their homes to the sea, taking to the paths at apparently fixed times of day.

Americans on expeditions to Antarctica are getting a close view of these birds for the first time. Maybe some day we will have a better "tale of penguins."[1]

[1] Persons who wish to secure additional information about and pictures of penguins will find the following references useful: (1) April 11, 1955, issue of *Life;* March, 1956, issue of the *National Geographic Magazine,* and Cherry Kaerton's the *Island of the Penguins* published by the R. C. McBride Company in New York in 1931.

ANNUAL MEETINGS

The National Council for Geographic Education will meet in Philadelphia—1961, in Chicago—1962, and in Columbus, Ohio—1963. Plan to attend all of these inspirational meetings.

MAPS AND GLOBES IN THE ELEMENTARY SCHOOL PROGRAM

J. D. McAULAY
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GEOGRAPHY helps give structure to social studies.[1] Without this structure social studies has little sense "of place," has no proper explanation of the interrelationship between peoples and the earth. Two of the chief tools used in building this structure are the globe and the map. Without these tools the elementary school child cannot secure the knowledge, the skills, the understandings, the appreciations of the attributes of place and the relationships of these attributes. A good teacher of geography and/or the social studies not only displays good, accurate maps and globes in prominent positions in the classroom but also makes continual use of these important teaching-learning tools. The child should consider the map and globe as essential to his learning as is the encyclopedia, the dictionary and the textbook.

The Globe

The globe is the heart of map work in the social studies. Every classroom should have a large light-weight globe which has simple but clear geographical information. The globe should be constantly used—for current events, for historical references, for literature placement, and for location of scientific information. The teacher should use the globe first in locating events or places. Then, if more detail is required, she should refer to the wall map. The globe should be located in a convenient place where it is easily accessible to the teacher and children for both class and individual use. A front corner of the classroom is a suitable spot. Beside the globe should be a ring of heavy cardboard with an inside circumference equal to that of the globe and having measured intervals representing degrees or miles. The child can slip this ring over the globe and quickly measure the shortest distance between any two points.

The globe used in the elementary school must be large enough that the child can easily find important locations. It must be sufficiently light in weight for the child, even of the primary grades, to hold and handle it comfortably. A sixteen-inch model showing the basic physical features of the continents and oceans is suitable for all elementary grades, but particularly for the fifth and sixth. It should be light in weight, have standardized colors and be so designed that the globe can be removed easily from its cradle. For use in the third and fourth grades the geophysical relief work globe is excellent. With such a globe the child can feel, as well as see, that the Himalayas are the roof of the world, that Greenland is a great plateau. A globe of this type is usually divided into north and south hemispheres. Washable paints can be applied to color the oceans, continents, empires or nations and other political areas. For the primary grades a globe on which chalk can be used is most suitable. A twenty inch model with the oceans in one color and the continents in another but containing no lines of latitude or longitude is most appropriate. The child can mark plane trips, ocean voyages, the equator, and the poles with chalk which can be erased. Then the globe can be marked with other information.

The child should learn very early that a map is only a representation of the globe. He understands, through the globe, that the earth is a rotating sphere, spinning in a counter-clockwise direction and producing day and night. The globe

[1] "What Geography Should Contribute to the Social Studies." A paper read by Helen Harter at the Kansas City Meeting of the National Council for the Social Studies, Nov. 28, 1959.

illustrates to the child the position of a point of area in relation to the rest of the earth. The concept of latitude and longitude, of wind belts, of the international date line, of the relationship of water area to land area can be taught efficiently only with a good globe.

Wall Maps

Wall maps should also be readily available to the effective social studies teacher. For the elementary school grades a slated outline map of the world and/or the United States is most effective. Using an atlas as a reference, the child can place on the chalk map pertinent information which can be conveniently erased when no longer needed. For the third and fourth grades, the geographical-terms chart done in standard colors of land elevation is quite usable.

If possible maps should be hung on the north wall of the classroom so the child can secure a correct concept of direction. Then the child learns that when he faces the map the west is on his left, the east on his right. But more important, the child must be given an understanding of the relationship between the wall map and the globe. For example, the difficulty of transferring a sphere to such a flat surface as an United States Air Force physical political global chart of the world becomes apparent by cutting an orange in half, removing the pulp from the one half, then placing the empty hull, arched, on a flat surface.

In addition to the wall map the teacher should have many types of maps available. Newspaper maps,[2] road maps,[3] and maps of airways, are easily obtainable. Many companies distribute for advertising purposes many suitable maps which can be secured upon request.[4] Metrological bureaus, oil companies,[5] government survey departments, school supply companies,[6] are all sources of useful maps. If obtained, such maps should be filed so that they are conveniently available for both teacher and child.

Puzzle Maps

A supply of puzzle maps are also an asset to the social studies teacher. Creative Play Things, Inc.,[7] has a rubber relief map puzzle which is unbreakable, washable, and scalded accurately. The contours are in three dimensional relief and show all the major mountains, rivers, valleys and state capitals. Such a puzzle map gives children experiences during which they learn the location of states, their relation one to the other, and the relative size and contour of each. The Play-Skool World Map puzzle,[8] secured at any drug store toy counter, serves similar purposes. The teacher can manufacture her own puzzle map from plyboard. Sheets of carbon paper are placed face down to cover the board and a physical map cut from an old geography book or atlas tacked or stapled above the carbon so the map will be drawn upon the board. The teacher or children can then paint the outline and cut it out into a puzzle with a jigsaw. Such map puzzles help the child to comprehend, kinesthetically, place location. A supply of game maps are also beneficial.[9]

Teacher-Made Maps

The teacher should also use maps which she has made. These may be constructed as outline maps on Manila tag or

[2] "The News of the Week in Review" Section of the Sunday New York *Times* contains excellent maps.

[3] Local tourist bureaus are happy to donate outdated supplies of road maps to a teacher.

[4] One such company, The Allstate Insurance Co., 35 59th St., Philadelphia 17.

[5] Amoco's "Venture Into Space," American Oil Company, 555 Fifth Ave., New York 17, N.Y.

[6] Denoyer and Geppert's (5235-5257 Ravenswood Ave., Chicago 40, Ill.) Map and Globe catalogue can be used as a reference atlas.

[7] Creative Play Things, Inc., Dalmatia, Pennsylvania.

[8] Play-Skool, 3900 N. Claremont, Chicago. Illinois.

[9] John D. McAulay, "Game Maps for the Social Studies in the Elementary School," *Journal of Geography*, LXVIII, No. 5, May, 1959, 246.

on the blackboard and traced from the image cast from an atlas or book by an opaque projector. Such a teacher-made map should contain only selected information. It is best to have several outline maps of the United States, for example side by side. One can be used for the distribution of raw materials, one for the location of natural regions, one indicating river mouths that have helped in the location of settlements. If one outline map becomes too cluttered with encyclopedic information, there is no meaning in the map for the child.

The teacher should construct one accurate colorful contour map each year until she has a usable supply. If the map is to represent mainly topographical features the scale of the altitude will have to be greater than the horizontal scale as the roughness of the earth's surface is insignificant compared to the extent of the surface area. For example, if the contour lines describe four different levels, (sea level; 5,000 feet; 10,000 feet; 15,000 feet) then the height of the contour map should also be of four levels, the flat surface, one inch, two inches and three inches. Thumb tacks might be used to outline contour divisions. Contour maps help the child to visualize place location in three dimensions.

One of the best methods of providing material with which to show elevation on contour maps is to cut tissue paper into squares of one or two inches. These are soaked in water over night and boiled for several hours. The water is then poured off and a cup of flour and water, the consistency of heavy cream, free of lumps, is added as well as two teaspoons of glue. The mixture is then worked with the fingers.

Pupil-Made Maps

Finally the child himself should have experience constructing maps and of locating products, natural features, cities, capitals, or nation states on a particular outline map. The elementary school child should not be asked to make his outline map free hand—such activity consumes much needless time and energy. The teacher should have a plentiful supply of mimeographed (or hectographed) map outlines from which the child may conveniently secure maps as needed. As a minimum each child should complete twice the number of maps within the year of the cardinal number of his grade. A sixth grader should complete at least twelve maps within the school year. Maps should vary in content. Some maps should be concerned with physical features, others with population or climate distribution, and still others with the location of products. Most children enjoy map work. But the teacher should demand standards in accuracy, neatness, and form. The child should learn early that the map he completes must tell a story as vividly as a written composition.

Children should be allowed to work as a group on a particular map—perhaps outlined on the board or on butcher paper—deciding, as a group, what content is essential and how such information should be illustrated. In the first grade such a group map project might be made with blocks. In the second grade a map of the community may be sketched on large sheets of paper placed on the floor. In the middle grades a group might construct a map of the President's visit to a foreign country or it might be a map of an intended school excursion.

Conclusion

Maps and globes are valuable and necessary tools of the social studies. They help develop concrete understandings of spatial relationships and arrangements of location and harmony. No teacher of the elementary school can give true meaning to the social studies without constant reference to and use of maps and globes. They are the keystone to proper teaching of geographic concepts.

THE NATIONAL COUNCIL AT WORK

The year just closing has been one of continued growth and progress for the National Council for Geographic Education. The total membership is now larger than ever before and the list of publications is greater than at any previous period. It is believed that both will continue to grow at an increasing rate.

One of the important functions of an organization is to establish and maintain contacts with other organizations. During the current year the Council has participated in several such contacts. Dr. Adelbert Botts represented the Council at the meeting of the American Academy of Political and Social Science in Philadelphia on April 8-9. Dr. John W. Morris represented the NCGE at a meeting of a special committee called by the American Council of Learned Societies, May 9-10, in New York, to discuss the problem of social studies in high schools. On June 20-24, Dr. James W. Taylor attended the meeting of the National Council on Teacher Education and Professional Standards in San Diego as a representative of the NCGE. Dr. Frances Hansen was the representative to the Council on Cooperation in Teacher Education on October 27-29 in Washington. The NCGE has also worked on different problems with the Association of American Geographers by joint committee activity. In addition the organization has been represented at the inauguration of seven college or university presidents.

Many members of the NCGE attended the Stockholm meeting of the International Geographical Union. Dr. A. K. Botts and Dr. H. H. Gross were the official representatives. Copies of the May 1960 issue of THE JOURNAL OF GEOGRAPHY were distributed to those in attendance. Many exceedingly favorable comments were made about the *Journal,* the Council, and its activities.

The retiring president thanks each committee member for the good work they have done with difficult tasks. The assistance given by the various officers and board members has been greatly appreciated. We are looking forward to a year of great activity under the leadership of Dr. Jewell Phelps.

JOHN W. MORRIS, *President*

EARL BENNETT SHAW RECEIVES DISTINGUISHED SERVICE AWARD

The Distinguished Service Award represents the highest honor that the National Council for Geographic Education can confer on an individual. The recipient of this award is recognized for contributions to the understanding and advancement of geography.

This year, the 1960 Award goes to a geographer long devoted to the training of teachers. His earnest concern for effective presentation of materials is reflected in his writings and publications. His careful and thoughtful treatment of subject matter reflects his awareness of the learning and understanding levels of students. These characteristics are clearly evident in his textbooks in human geography, economic geography, and the regional geography of North America. His active participation in professional geographic organizations is known to all. Articles of excellency in form and content have appeared in THE JOURNAL OF GEOGRAPHY and in *Economic Geography*.

In addition to a highly respected and devoted service of more than twenty-five years at a teachers college, he has been visiting professor in Puerto Rico, Fulbright Scholar in Cairo, Egypt, and lecturer on Latin American Geography at the World Federation of Educational Associations, Rio de Janeiro. He has taught during summer sessions at Clark University and the University of Pittsburgh. Recently he was on the staff at the University of Delaware.

He has served his country in various other capacities: Head of the Geography Branch of the United States Army University in England, a research member of the Board of Geographic Names, and served in the Office of Strategic Services. In World War I he saw action on the Western Front.

Following the completion of service in the United States Army, he resumed his education. He was graduated from Washington University at St. Louis with B.A. and M.S. degrees. Later he was granted the Doctor of Philosophy degree at Clark University.

The recipient has long been active in the Association of American Geographers. He is an associate editor of *Economic Geography* and also of THE JOURNAL OF GEOGRAPHY. In the National Council for Geographic Education he has been President and a member of the Executive Board and has always been a dependable chairman or member of any committee on which he has been asked to serve. He was the chairman of the committee on the up-dating of *The National Council As a Working Organization*. This report appeared in the May, 1952, issue of THE JOURNAL OF GEOGRAPHY.

His sustained devotion to the field of geography, his faithful attention to details, his happy faculty of working easily and readily with his colleagues and fellow geographers place him in high regard. The recipient of the 1960 Distinguished Service Award is—Earl Bennett Shaw.

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LORRIN KENNAMER, *ex-officio*
Cincinnati; November 25, 1960.

BOOK REVIEWS

Olive Burt. **The Cave of Shouting Silence.** The John Day Co., Inc., 210 Madison Avenue, New York, 1960. 191 pages with a map and table of contents. Juveniles age 12 and up. $3.50.

The scene of *The Cave of Shouting Silence* is the Virgin River country of south central Utah. Caleb Wilson, an orphan boy, is seeking evidence that he is the grandson and heir of Tom Virgin for whom the Virgin River is named. His grandfather was last heard of as being in that region. Caleb goes as a cattle herder with a party of Mormon's who have been sent to build a road into the Virgin River Valley. Towabe, an Indian boy, joins the party and becomes Caleb's friend and helper. In the course of their work with the Mormons, they have many adventures and discover the beautiful canyon now known as Zion National Park. Through his friendship with Towabe, Caleb learns to respect the Indians' customs and religious secrets. He realizes that the Indians justly resent the attitude of most of the whites who appropriated their hunting grounds.

The beauty and fascination of the desert and canyon country is seen through Caleb's eyes as are also the hardships encountered by the pioneers in opening up a new and forbidden region.

Boys and girls and even adults will enjoy this story with its mixture of mystery and adventure, plus a description of the magnificent canyons, mountains, and terrifying floods.

ZOE A. THRALLS

University of Pittsburgh

Stephen H. Spurr. **Photogrammetry and Photo-Interpretation.** The Ronald Press Company, New York, Second Edition, 1960. 472 pages with photographs, maps, diagrams, index, and table of contents. $12.00.

This is the second and re-titled edition of *Aerial Photographs in Forestry* which appeared in 1948. The new edition is about 50 per cent larger, is completely re-organized, apparently largely rewritten, and "has been broadened to serve all nonphotogrammetrists who use aerial photographs as a professional tool." It includes a large number of excellently chosen and well reproduced aerial photographs as well as useful maps, diagrams, and photographs of instruments and their usage.

Photogrammetry and Photo-Interpretation is divided into five parts—Aerial Photographs (in general), Photogrammetry, Mapping, Photo-Interpretation, and Forestry Applications. The new edition contains less emphasis upon aerial photographs in forestry, and discussion of such applications, much of limited value to geographers, has been reduced from over 50 per cent to about 25 per cent of the book. Welcome additional interpretative material has been added on soils, landforms, vegetation, agriculture, and urban land use. Chapter 18, "Photo-Interpretation of Human Activities and Structures" should appeal to geographers; unfortunately, however, it is an extremely short chapter.

The author's original edition long has proved a valuable aid to many geographers interested in aerial photographs in terms of reading, interpretation, and elementary photogrammetry. This new edition is a vast improvement in every way over its predecessor. There long has been a need for an elementary textbook in aerial photography written by a geographer and designed for the use of geographers. No such textbook exists but Spurr's new edition appears to come closer than any other to fitting this need.

ROBERT C. KINGSBURY

Indiana University

Wilfred Thesiger. **Arabian Sands.** E. P. Dutton and Company, New York, 1959. 326 pages.

Wilfred Thesiger's "Arabian Sands" depicts, in an exceedingly interesting way, a series of travels made in Southern Arabia during the years 1945-50. A major part of the volume deals with his two trips across the "Sands" or Empty Quarter of Arabia. Also included are descriptions of journeys in the Hadramaut and Oman and travels, as a young man, in Ethiopia and Sudan.

Thesiger may well be the last of the "explorers" of Arabia: one of that intrepid group of Europeans—among whom are Doughty Burton and Philby—who travelled without modern conveniences or machines; who underwent great hardships and often faced death because they were fascinated and drawn to some aspect of the area, and felt exiled when they returned to civilization.

Besides the excitement and interest of Thesiger's story, geographers will find much of value in his descriptions and analysis of the physical features of a little known area, and in his portrayal of the culture of the Bedu—a culture which the author, with reason, feels is fast disappearing. Thesiger crossed the Empty Quarter with Bedu companions on foot or on camel; today Aramco technicians working in the "Sands" use cars and planes and live in air-conditioned trailers.

JOHN R. RANDALL

The Ohio State University

F. J. Monkhouse. **Landscape From The Air.** Cambridge University Press, 32 East 57th Street, New York 22, New York, 1960. 52 pages.

This book is a valuable contribution to Physical Geography from the viewpoint of analytical and descriptive materials of oblique air photographs. The book contains 52 photographs with the written emphasis on landforms. Analytical and descriptive stress is placed on the surificial aspects. Rock structure and composition, as affected by weathering and erosional agents, are woven into a meaningful and useful pattern for

the physical geographer without unwarranted space devoted to landform genesis. While analysis and description is focused on a specific land feature, widely distributed type examples are cited. The book follows the rather conventional division of geomorphology texts. i.e., major rock classes, erosional agents, ground and surface water, glaciation, work of the wind, and shorelines. Easy and usable references from photograph to map is an added attraction.

If "landscape" and "physical geography" are taken in full connotation, then the work falls somewhat short of the title implications. While climate is included in the sculpturing agents there is a notable lack of analysis and description of the pedologic-vegetative association that might be useful to the physical geographer in landuse analysis and interpretation.

M. JOHN LOEFFLER

University of Colorado

S. W. Wooldridge and R. S. Morgan. **An Outline of Geomorphology,** Second Edition. Longman's, Green and Co. Ltd., London, 1959. XVI and 408 pages, with 271 diagrams and illustrations, bibliography, index, and table of contents. $6.50.

This edition is a revision of the first, published originally in 1937 under the title *The Physical Basis of Geography: An Outline of Goemorphology,* which was reprinted ten times previous to the new edition in 1959. Based on experience in teaching and on research in the field by the authors, the book provides an excellent discussion of the more important aspects of geomorphology.

Written in lucid English, it is smoothly readable—a brief discussion with no superfluous paragraphs nor additional citing of examples to support the clear concise statements of the major ideas of geomorphology.

The first ten chapters, pages 1-132, dealing with the origin and structure of the earth, take account of new views pertinent to the earth's origin. Chapters XI-XXIII, pages 133-393, cover the sculpturing of the earth's crust—agents, processes, and land forms. Material in Chapter XVII, first edition, has been omitted and replaced by a discussion of "The Problem of Slopes," a subject of particular interest with respect to origin and to utilization.

An abundance of diagrams and photographs illustrate the theories presented and the landforms discussed. Naturally most illustrations are from or applicable to England, a fact which makes this text well suited for use in England, and especially valuable for use in other lands. Too often American students believe that landforms exist only in the United States! The brief annotated bibliography provides the principal original sources of material, for the authors state in the preface to the second edition, " 'Honours Standards' are obtained not by reading textbooks but original publications." This is an excellent basic text on geomorphology, and as the authors state, "Geography cannot dispense with pure geomorphology, for a real understanding of the characters and development of the physical landscape is an indispensable preliminary to the study of the cultural landscape and of regions."

SIDNEY E. EKBLAW

University of Kansas City

Julian H. Steward and Louis Faron. **Native Peoples of South America.** McGraw-Hill Book Company, Inc., New York, 1959. 481 pages with maps, phootgraphs, diagrams, and index. $11.50.

Those who are familiar with the monumental *Handbook of South American Indians,* edited by Julian H. Steward, but who find its comprehensiveness a little bewildering for their particular purposes, will welcome this eminently readable, one-volume condensation of the former six-volume work. The book presents much more than descriptive enumeration of cultural traits of the various Indian groups. It offers cogent interpretations of cultural evolution beginning with very primitive man, as exemplified by nomadic hunters and gatherers, passing through various types of communities and states based upon agriculture, and culminating in the Central Andes in fairly sophisticated militaristic empires supported by irrigation farming.

Principal themes are organized in terms of the central Andean irrigation civilizations in all their evolutionary stages, the chiefdoms of the Circum-Caribbeans Area and Eastern Bolivia, the warring chiefdoms of the Northern Andes and Central America, the theocratic chiefdoms of Venezuela and the Greater Antilles, farmers and pastoralists of the Southern Andes, the chiefdoms and villages of the tropical forests, and the nomadic hunters and gatherers.

Particularly valuable are the concise introductory and summary portions which lay the various threads of the South American cultural fabric in a meaningful perspective of time and space. This distilled essence of the work of so many able scholars is in such a palatable form that no student of South America can afford to be unfamiliar with its contents.

KEMPTON E. WEBB

Indiana University

Otis W. Freeman and H. F. Raup. **Essentials of Geography,** 2nd Ed. McGraw-Hill Book Company, Inc., New York, 1959. 543 pages with illustrations, tables, diagrams, index, and 15-page colored atlas. $7.75.

The revised edition of this book continues the logical organization and presentation of the former edition. The beginning student should not get bogged down in complex asides.

Basically the book follows the scheme of the previous edition. A major departure is the combining of chapters on "Climatic Regions of the World" and "Geography of Plant and Animal

Life" into a new chapter, "Climatic and Biologic Regions." In doing this only one climatic classification is mentioned, the others, along with a world climates map, are placed in an appendix. Other changes noted are the rearranging of the chapter on "Deserts" to one on "Dry Tropics," while mid-latitude dry areas are discussed as part of "Mid-latitudes of Prevailing Westerlies"; and the deletion of the topic on magnetic declination from the section on maps. The inclusion of a short atlas seems superfluous. Due to the map scale many places mentioned in the text cannot be located with any degree of precision.

Strongly in its favor is the plan of the book. It starts by developing the earth's stage; then introducing vegetation, animals, and man to the picture; and culminating with the various uses which man makes of the earth. As this book may be used by students training to be teachers, the inclusion of discussions on the conservation of soils, water, minerals, and forests in appropriate chapters is to be highly commended.

Logical, uncluttered organization plus completeness and up-to-date presentation of material make this an excellent text for the introductory course.

ROBERT D. LORING

DePauw University
Greencastle, Indiana

John C. Caldwell. **Let's Visit the West Indies.** The John Day Company, Inc., 210 Madison Avenue, New York, 1960. 96 pages with table of contents, photographs and index. $2.95. Ages: 8-12.

Let's Visit the West Indies by John C. Caldwell is a book that should be most attractive to young people of junior high school age, but would not be without interest to older students and adults. It is an up-to-date description of the geography and history of the West Indies Federation and the French and Netherlands West Indies. The Greater Antilles are not covered in detail, but there is a wealth of information concerning the lesser known islands of the Caribbean.

The book is well illustrated with many photographs, a location map, and a table showing the relative area and population of the various islands. There is a table of contents and the book is well indexed.

The book is roughly divided into two parts. The first part is a general description of the geography and history of the islands as a whole. One of the values of the book from the standpoint of geography is the way the author relates the history to the present activities of the people, population pattern and political arrangement. The second part of the book is a more detailed account of the individual islands. The section dealing with the new West Indies Federation is a good evaluation of the economy, possibilities and problems confronting this new nation.

It is an easily read book with a great deal of information and should be appealing to the young reader.

JOHN F. LOUNSBURY

Antioch College

Kenneth B. Cumberland and James W. Fox. **New Zealand, A Regional View.** Whitcombe and Tombs, Ltd., Christchurch, Auckland, New Zealand, 1958. xvii and 280 pages including maps, diagrams, index. 18s 6d.

This high school level text replaces a series of Post-Primary Bulletins of the New Zealand Department of Education bringing these up-to-date and in addition providing an introductory "New Zealand as a Whole" section as well as a closing chapter on the four main cities (Auckland, Wellington, Christchurch, Dunedin).

For the first time detailed information is available within one cover for each of the eleven regions of New Zealand (five in North Island, six in the South). Each illustrated study includes material on the history of settlement, on surface and climate, as well as the present population patterns and land use.

The text is authoritatively written, is very readable for the levels intended, and the pictures are well chosen and photographically good. Map content is very favorable and well planned, but some of each series for a region, particularly those with place names, have been so greatly reduced that they are not legible. Transport maps do not differentiate between roads and railroads. Perhaps one should recommend a Bartholomew map of New Zealand with each copy.

This publication will serve as an interesting reference in the high school, is useful at college level as a supplement to other materials available, and should prove helpful to others who are desirous of learning more about this land "down under."

LYDA BELTHUIS

University of Minnesota

Barnett D. Laschever. **Getting to Know Hawaii.** Coward-McCann, Inc., New York, 1959. 64 pages with illustrations, index, and source list. $2.50.

Getting to Know Hawaii, intended for the 8-12 year age group, can serve as entertaining and instructive supplementary reading about our fiftieth state. In this short volume the history of Hawaii has been interwoven with descriptions of the peoples and their customs and of the leading industries. The author has made the most of Hawaii's "romantic history." Geographic descriptions are more incidental, but they are scattered through the book. It is profusely illustrated with sketches on almost every page.

Most of the criticisms a geographer has on reading this volume are the unavoidable result of limitation of space combined with the author's use of standard generalizations. The result is geographic descriptions which fail to bring out

many of the interesting and important environmental contrasts that are to be found on the islands. One error, common to many books on Hawaii, is that of listing defense as Hawaii's third ranking industry instead of first, although the actual income to the islands from the defense industry is correctly given as greater by several million dollars than that from either sugar or pineapples.

Young readers should enjoy using the Hawaiian names and words, but it would have been helpful had the rules for pronunciation been placed near the beginning of the book rather than on page 44.

In spite of these and other minor criticisms, the book gives a good feel for Hawaii itself, as well as for the similarities and differences between the first island state and mainland United States. If used as supplementary reading, it should make a useful contribution toward "getting to know" Hawaii.

ELIZABETH EISELEN

Wellesley College
Wellesley, Massachusetts

David I. Blumenstock. **The Ocean of Air.** Rutgers University Press, New Brunswick, New Jersey, 1959. 416 pages plus 23 pages of notes on the text, 16 pages of index, 14 black and white maps. $6.75.

This volume accomplishes at least three things. (1) It provides a rather free style exposition of material that is highly useful as supplementary information for students of Weather, Meteorology, Climatology, and Physics, and for the interested layman. (2) It sets forth in varying degrees of completeness, in addition to the usual facets of atmospheric phenomena, a number of commonly by-passed considerations, or in other cases new information. In this list are: new details on the upper air layers (Ionosphere and Exosphere), microclimatology in several applications, stress of geographic interrelationships with atmospheric activities, the latest Weather Bureau theory of the formation of tornadoes, meteors, electromagnetic phenomena, aids in weather forecasting, and many nuclear findings including their effects upon man. (3) It embodies twelve years of research and writing, which are backed by the scrutiny of numerous scientists in the fields of Physics, Meteorology, Geography, Zoology, History, and others, as well as personnel in the several Armed Forces and Weather Bureau. The author himself has had broad training and experience.

Although the book varies in difficulty from place to place, most of it is fairly easily grasped and should be an asset to all interested persons.

Two omissions stand out: (1) a complete lack of illustrations, except the maps, and (2) lack of explanations in a few cases where they would be most elucidative.

GEORGE C. DE LONG

Eastern Michigan University
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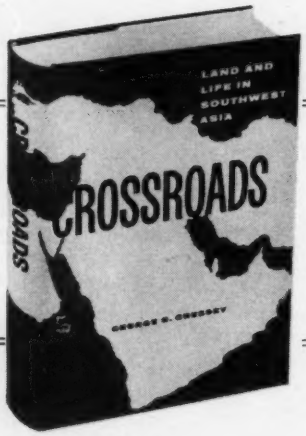

by George B. Cressey

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J. B. LIPPINCOTT COMPANY
Philadelphia and New York

The fifth annual convention of Pennsylvania Junior Geographers was held on April 29-30, 1960, at the Hampton Township Junior-Senior High School, Allison Park, Pennsylvania. Approximately 350 geography-minded teenagers representing 20 schools attended the convention.

Club Projects

The clubs from Lewistown, West Chester, and Hampton Senior High School presented a program, "Projects to Stimulate Club Interest." The Hampton Club explained the organization and execution of a thousand mile, five day and four night field trip they had taken to the eastern part of the state. The West Chester club described their various activities, including a conservation project and annual field trip. The group from Lewistown described and fund-raising and execution of a recent week-long trip to upper New York state and the St. Lawrence Seaway.

35 Clubs in Pennsylvania

At present there are 35 organized junior geography clubs in Pennsylvania. Included in this group are more than 800 girls and boys who are interested in the advancement of geography. Anyone wishing to organize a club may secure information and a sample constitution from Dr. Norah Zink, Professor of Geography, Indiana State College, Indiana, Pennsylvania.

Do you have the new poster entitled, "How Grass Makes Food For Growth?" This poster, which measures 25 × 30 inches, is of several colors and should prove very useful for any grade level between the fourth grade of elementary school and college. It was issued June, 1960, by the Soil Conservation Service, U. S. Department of Agriculture, and may be secured for 15 cents.

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